

The National eStrategy for Lebanon

The United Nations Development
Programme

The Office of the Minister of State for
Administrative Reform

Document 6:

Programs, Solutions
and Recommendations

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1.0 Introducing Programs, Solutions and Recommendations

This document presents various strategies that were developed in the National eStrategy for Lebanon project. These strategies were developed in response to the recommended Policies presented in Document 4 of the project: National ICT Policies for Lebanon.

1.1 From Policies to Programs, Solutions and Recommendations

The relationship between Policies and Programs, Solutions and Recommendations was discussed in Document 4 and follows the logic of this diagram:

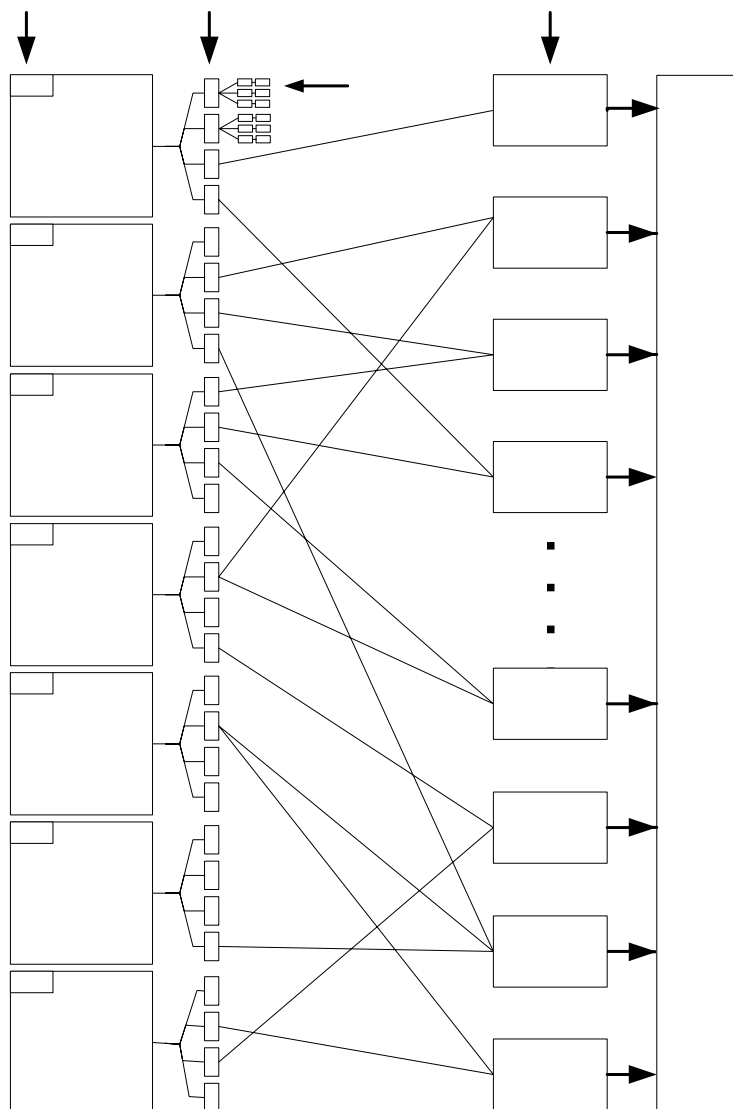


Figure 1: From Policies to Programs, Solutions and Recommendations

The above diagram shows that a specific strategy may address more than one policy.

The strategies presented in this document are grouped into three main headings:

- **Programs or General Courses of Action** that can be implemented through programs consisting of several projects. These are sometimes called "Programmes".
- Specific **Solutions** that can be implemented through clearly defined projects
- Single purpose **Recommendations** that need to be implemented

This document presents a description of each of the above strategies.

1.2 Classifying Programs, Solutions and Recommendations

The Programs, Solutions and Recommendations have been prepared as an overall "inventory". No attempt was made to sort them in this document according to any pre-established criterion.

As per Figure 1, it can be seen that each Program, Solution or Recommendation can address more than one Initiative. Furthermore, each can also be classified under any of the following classifications:

- Initiative
- Sector
- Ministry
- Technology
- Theme
- Project result or product
- Etc

As it is not possible to present such a classification in text format, two approaches have been provided:

1.2.1 The Index Help File Format

The full document was converted as a stand alone Help File. This allows the reader to view each Program, Solution and Recommendation on its own, in one topic. However, to aid the reader, each topic was indexed according to keywords that relate to it under the above classifications. Additional keywords that do not relate to the above were also added. The Index tab allows the reader, for example, to select a keyword such "Health" and he or she will be directed to all Programs, Solutions and Recommendations that are concerned with the keyword.

The Help File can be downloaded from OMSAR's web site for the National eStrategy for Lebanon at www.egateway.gov.lb.

1.2.2 Tabulation of Programs, Solutions and Recommendations by Initiative

The following tables present all Programs, Solutions and Recommendations in tabular form, marking each for the Initiative(s) that it falls under.

ID	Programs	Initiatives						
		1	2	3	4	5	6	7
		eReady	Nat'l	ICT	Human Cap	Social	Econ Bus	eGov
1	Launch ICT Enabling Legal Framework	X	X	X			X	X
2	Improve the Affordability of Internet Connection	X		X				
3	Improve Network Speeds in Lebanon	X		X				
4	Increase Internet Penetration	X		X				
5	Promote Proper Usage of the Internet	X		X				
6	Increase PC Penetration	X		X				
7	Improve Electrical Power Quality	X		X				
8	Increase Government's Yearly ICT Budget	X						X
9	Top Ten eGovernment Projects							X
10	Encourage ICT Certification Programs in Academia			X	X			
11	Encourage International ICT Exhibitions and Fairs in Lebanon		X	X	X		X	
12	Capacity Building for Public Sector ICT Staff	X			X			X
13	Public Sector Data Definition and Exchange							X
14	Promote and Improve Lebanon as a Training Venue				X		X	
15	Implement Centralized/Decentralized Databases							X
16	Free Information Access Points	X	X			X		
17	Develop Women Based Cottage Industries					X	X	
18	Encourage Foreign Direct Investments in the ICT Sector			X			X	
19	Virtual / Open University				X	X		
20	Develop Specific eLearning/CBT Content for Lebanon				X	X		
21	Combat Illiteracy through Computer Based Training and eLearning				X	X		
22	Use Media to Promote ICT		X	X	X	X	X	X
23	ICT Research and Development Centers		X	X	X		X	
24	Standardize and Spread the Use of GIS		X					X
25	Widen the Use of the Global Positioning System (GPS)		X					X
26	Prepare Lebanon to be an ASP Center		X				X	
27	Deregulation of Telecommunications Sector	X	X				X	

Figure 2: Programs Classified by Initiative

ID	Solutions (Page 1 of 3)	Initiatives						
		1	2	3	4	5	6	7
		eReady	Nat'l	ICT	Human Cap	Social	Econ Bus	eGov
1	Lebanon Competency Center			X				
2	Activate and Speedup Online Banking	X				X	X	X
3	Multipurpose Community Telecenters (MCTs)		X		X	X		
4	Audio Video Streaming for Mobiles					X	X	
5	Implement Terrestrial Cable Network	X	X	X				
6	Public Notary Services							X
7	Educational Career Counseling				X	X	X	
8	Launch Project/Entity to Gather and Publish ICT Data	X	X	X		X	X	
9	Setup a Government Entity to Handle ICT Matters	X	X	X	X		X	X
10	Volunteering Services Network			X		X		
11	Lebanon Business Promotion Entity		X	X		X	X	X
12	Text to Audio - Arabic Talkster					X	X	
13	Survey Educational Software				X	X	X	
14	The Internet Hub Project	X	X				X	
15	The Citizen's Guide to Health Information and Services					X		X
16	Whats On in Lebanon	X				X	X	
17	Setup Information Decision Support Center						X	X
18	Implement ICT Standards and Guidelines		X	X	X		X	
19	Arabic, English and French Glossary		X					
20	The Citizen's Guide to Legal Issues		X			X	X	X
21	The Citizen's Guide to Governmental Procedures		X			X		X
22	Develop Public ICT Literacy Syllabus and Benchmarks			X	X	X	X	
23	Develop Strategic ICT Planning for Each Ministry and Agency				X			X
24	Trade Information Center		X				X	X
25	Trade Point for Lebanon		X				X	X
26	Setup Business Startup Advisor					X	X	
27	Provide Comprehensive Electoral Information Online	X	X			X	X	X

Figure 3: Solutions Classified by Initiative (Part 1)

ID	Solutions (Page 2 of 3)	Initiatives						
		1	2	3	4	5	6	7
		eReady	Nat'l	ICT	Human Cap	Social	Econ Bus	eGov
28	Publish Terms of Tenders and Bids						X	X
29	Reform ICT Labor Laws		X	X		X	X	X
30	Digital Cultural Heritage Protection/Diffusion (Vmuseum)		X			X		
31	Guide and Search Engine for Lebanese Web Sites		X			X	X	
32	Launch Web Based Tax Filing Forms		X				X	X
33	ICT Donations Clearing House					X		
34	The Citizen's Guide to Skilled and Craft Services on the Web					X	X	
35	The Citizen's Guide to Consumer Protection			X		X		X
36	The Citizen's Guide to Road and Transportation Information					X		X
37	National Awards for Excellence in ICT			X	X			
38	Sports and Recreational Network					X		X
39	Youth Network	X			X	X		
40	Guide to International Relations and the Diplomatic Network	X				X		X
41	Technical Cooperation Network			X		X		X
42	Library Network				X	X		X
43	Setup Database of Studies, Theses and Articles						X	X
44	Online Commercial Registry			X			X	X
45	A Lebanese Gutenberg Project					X		
46	Setup Data Entry and Transcription Centers					X		
47	Setup Job Opportunities Portal / Center			X		X	X	
48	Manage ICT Resources in the Public Sector	X	X					X
49	Setup Document Tracking and Mail Registry Application							X
50	Tourist Network					X	X	
51	The Citizen's Guide to Labor Relations					X	X	X
52	Agrobus					X	X	
53	Encourage Media to Go Fully Online					X		X
54	Judiciary Knowledge Base					X		X

Figure 4: Solutions Classified by Initiative (Part 2)

ID	Solutions (Page 3 of 3)	Initiatives						
		1	2	3	4	5	6	7
		eReady	Nat'l	ICT	Human Cap	Social	Econ Bus	eGov
55	Resolve Administrative Anti-Patterns in the Public Sector						X	X
56	Establish a Country Development Gateway					X		
57	Social Affairs Information System					X		X
58	Informal ICT Training Programs			X	X	X	X	
59	ICT Skills Portal			X	X	X	X	
60	Launch National ICT Professional Association	X		X	X		X	X
61	Improve Software Development by Following the CMM™			X	X		X	X
62	Improve Project Management in ICT Units			X	X		X	X
63	Low Income Family PC Kit				X	X		
64	Disability Legal Framework					X		
65	Disability Training, Counseling and Technology Center					X		
66	Disability Resources Portal					X		
67	Virtual Citizen Communities					X		
68	Students Online Loans				X	X		X
69	Launch Lebanon Based International Call Centers						X	X
70	Charity Services Network					X		X
71	Link to International Networks		X			X		
72	Disseminate Statistics of Ministry of Social Affairs					X		
73	Online Official Gazette						X	X
74	ICT Training and Incentives for Public School Teachers				X	X		
75	Prepaid Charge Card for Public Sector Transactions	X					X	X
76	Implement a National ID and Smartcard		X				X	X
77	Increase International Bandwidth		X	X			X	
78	Post .lb Domain for Sale						X	

Figure 5: Solutions Classified by Initiative (Part 3)

ID	Recommendations	Initiatives						
		1	2	3	4	5	6	7
		eReady	Nat'l	ICT	Human Cap	Social	Econ Bus	eGov
1	Improve Efficiency of Government Telecommunications Providers	X						
2	Improve the Utilization of the Land Line Network	X						
3	Amend Building Laws to Cover ICT Usage	X						
4	Reduce Import and Export Complexities	X						X
5	Remove Trademarks as a Prerequisite for Domain Names	X		X			X	
6	Create Incentives for ICT Training Companies	X		X			X	
7	Start ICT Education at an Earlier Age	X			X			

Figure 6: Recommendations Classified by Initiative

2.0 Programs (Or General Courses of Action)

Programs are general courses of action that are executed over a longer range of time. They would consist of a process or a general driving made up of many projects implemented by various parties.

2.1 Launch ICT Enabling Legal Framework

Purpose: To develop the necessary legal framework for ICT processes so that all current stumbling blocks can be alleviated and all legal requirements necessitated by new and emerging technologies can be setup to ensure proper adoption of ICTs.

Description: Modern law is based on the assumption that every action is based on a physical, personal and time dimension. Modern law is based on centralization of government and its monopoly and control over its own territory.

These assumptions have been challenged by ICT. For a start, there are cross border transactions and activities uncontrollable by government. Secondly, the personal dimension has been removed. Computers can produce transactions by intention or error. The source is often untraceable. The domain registration is not a legalized process so no verification of owners is made. The time dimension is irrelevant and sometimes untraceable. The physical dimension has been replaced by the electronic dimension: information can be duplicated and modified with ease. (Example: in Lebanon, it is not allowed to present color scanned copies of IDs or driving licenses for fear of deceiving the recipient that these are originals. Yet, anyone can use suitable illustration software to modify a black and white copy of a passport or a driving license).

Internet law is still unclear. It is no more a matter of modifying existing laws to suit a new situation. A paradigm shift in the legal concept of Internet law is required. New concepts are needed that define value, injury, obligations and legalized authorization.

The framework needs to be developed with the following pre-conditions:

- The legal framework should not be left to the Government on its own. It should be a coordinated effort between such parties as the ICT industry, the private sector, the legal profession, the Central Bank, international experts and key Ministries.
- It should be flexible and innovative to cope with the changing face of technology
- The legal framework should not be based on additional controls and restrictions already encumbering the citizen's life and that of the private sector. (For example, a trademark registration is required for registry of a Lebanese domain name. No other country requires that.)
- The framework should be fair, democratic and compliant with the basic principles of the Lebanese constitution.
- It should be predictable. (View the above mentioned law on color scanning).
- New laws should be quickly analyzed, decreed and implemented.

Currently, there are several initiatives over such issues as: eSignature, intellectual property rights and eCommerce. These are necessary and important efforts. However, they remain disjointed being put forward by different parties. Furthermore, the legal issues related to ICT have not been globally addressed.

It follows that in order for Lebanon to be eReady and for it to have a thriving ICT sector, the legal framework needed for this sector must be globally addressed.

A comprehensive framework should address the following issues but not be restricted to them:

- eSignatures
- The legalization of eDeeds (Documents produced by a computer system)
- The legality of web based transactions
- Electronic payments
- Confidentiality of information
- Freedom of expression and communication
- Banking related issues
- Encryption requirements and standards
- Security requirements and standards
- Procurement related issues
- Unfair practices: misuse of meta-tags to drive traffic to one site, spamming, occupation of home pages (Changing default browser home page to one's own), cyber-squatting or page hijacking (Occupying someone's website), denial of service (DOS), etc.
- Improper conduct: dangerous, unlawful, anarchic or inappropriate conduct
- Consumer protection: extending such laws to web situations
- Intellectual property protection
- Cyber crime: hacking, fraud, misuse of credit cards, virus generation and propagation (Including all related diseases such as Trojan horses, worms, etc), etc.
- Interactions between banks and all the following: citizens, public and private sectors.
- Clarification of taxation for web based commercial transactions, especially those that are contracted via non .lb domains.
- Electronic contracts
- Data protection and privacy
- Access to Information
- Electronic payments
- Liability issues
- Cross border transactions
- Taxation

Developing such a framework would be an ambitious project. The Government must regard this as a high priority issues and endorse it to ensure speedy development of laws and regulations.

Most importantly, the government's own internal regulations need to be revised. Whether this is a legal or an administrative reform issue is not critical to define. There are many regulations within the government that need to be revised. Here follows some examples:

- The acceptance of checks and transfers, eventually leading to online payments
- The legal issuing of documents by computers
- Authentication of various records
- The removal of archaic practices such as financial and rubber stamps
- The reduction of the number of signatures by transferring validation to the ICT application. (Example: an eTransaction produced by an employee with the

authority to do so need not be endorsed by higher officials and if so, then that endorsement should also be electronic).

2.2 Improve the Affordability of Internet Connection

There is a direct relationship between internet penetration and affordability of connection. This has been demonstrated internationally. Lebanon should reach higher than 20% penetration.

The following should be applied:

- Dial-up prices need to decrease by half. Currently, the rates follow an illogical structure where users pay by bracket and not by the hour. Secondly, the higher the usage, the higher the cost. There should also be an option to provide unlimited access at a fixed charge.
- ISPs are charging higher rates for 56K modems than is customary in regional countries. They relate this rate to the high costs of international bandwidth. This again is in the hands of the government and should be reduced.
- ISPs costs for leased lines and wireless access should also be drastically reduced. Again, this is related to the international bandwidth costs.

Following a separate recommendation, deregulating internet access so that all telecommunications companies can provide it would stabilize the market and result in lower costs.

2.3 Improve Network Speeds in Lebanon

The maximum speed allowed by the networks in Lebanon is 2 Mbps. The recommended broadband access speed for Lebanon is 10 Mbps which can be reached through the xDSL technology still to be made available in Lebanon. Broadband access is a necessity for:

- Companies who export ICT products and software. The need would be for quicker downloads and more responsive support of their customers abroad.
- Companies who have branches abroad.
- Application Service Providers is a new trend in application provision. Companies in Lebanon wishing to acquire such services are restricted by the available bandwidth.
- Regional service providers in non ICT related fields such as banking, insurance, health and tourism. These services are the foundation of the Lebanese economy.

2.4 Increase Internet Penetration

Improving Internet penetration generally relies on two approaches.

The first is to make access to the internet pervasive, affordable and reliable. This is responded to in other solutions and recommendations of this project.

The other approach would be to create a need for using the Internet. The Internet shares with ICT a common behavior. In the early stages of ICT usage, limited use of ICT led to additional requirements. Initial demands were converted to higher demands. When the technology became accepted, it went into a supply driven demand mode

leading to an "Avalanche" effect. Early in the development of ICT, its usage was never increased because the management wanted it or promoted it. ICT succeeded when there was a need for it.

It follows that recommendations should be made that would answer the need for using the Internet.

In various solutions recommended in this project, the aim is to provide solutions that address specific needs. The Internet would then be seen as useful and its usage will increase. Penetration would follow.

Secondly, some solutions are provided that convert wide spread services that are currently manual into web based services. This would entice manual users into acquiring Internet services. Furthermore, it would be reflected on the providers as a reduction in cost. (Refer to the Solution for online banking).

2.5 Promote Proper Usage of the Internet

Purpose: To promote the usage of the Internet through various means so that the Internet becomes a need and not just a source of entertainment.

Description: Past generations have always battled with the issue of reading. Children and young people were always encouraged to read. The publishing and the education industry developed their own schemes to entice children and young people to get involved in reading. A recent initiative by the Ministry of Culture had well known Lebanese figures read chapters of books to children.

The Internet today is in a similar situation with two main differences. The first is that the Internet is often used for the wrong reasons. The second is that the drive to use the Internet properly is not to be restricted to the young.

The Solution proposes a drive with two objectives:

- Increase the proportion of Internet users that are using it properly
- Encourage new usages of the Internet

The means are many. Some relate to creating direct requirements while others are promotional. These are described below.

The benefits of the proper usage of the Internet are the following:

- Internet penetration will increase resulting in additional exposure to Internet facilities promoted by the Government through the other Solutions proposed separately
- Improvement in general education
- Improvement in knowledge of English and French
- Narrowing the digital gap by widening the dissemination of information
- Improving democratic processes by providing citizens with means to communicate, express and empower themselves and get involved in the processes of government.

The following means are proposed:

- Launch a campaign whereby the media provide regular reviews of key Internet sites. In the early days of the Internet, many books were published highlighting such sites. With the massive proliferation of web sites, this became impossible to achieve. It therefore becomes more necessary for the media to research the web and come out with different recommendations. Mondays could be for sites related to hobbies, Tuesdays could be for sites related to sports, Wednesday could be for sites related to social issues, etc.
- Those organizations that introduced ICT successfully did not often achieve their aim because of management promotion or encouragement. ICT was introduced as part of the day to day life of employees and became necessary to them if they wished to retain their positions. Today, the Government needs to press for such uses of the Internet. The first target is Banks. The Central Bank should launch a drive that goes into several phases. The first phase should be immediate and should allow all bank customers to review their detailed statements and positions on the web. Automatically, this will result in a surge in Internet usage.
- The same approach should be applied to various other sectors such as education (Where parents and students can review their progress or get assignments), insurance (Where customers can track their claims), travel (Where passengers can confirm their flights, get information, etc).
- Other solutions proposed have dealt with this issue indirectly. For example, Community Telecenters by the simple fact of being introduced with support, will encourage proper Internet usage. Youth and sports networks will also achieve the same result.
- Encourage schools to direct their students towards the proper use of the Internet by suggesting interesting sites, providing web related assignments, etc.
- School curricula should be encouraged to have at least 2 hours of guided browsing per week.
- Companies advertising in the various media should be encouraged to state their web site or email addresses in the ads.

The above should be a concerted effort and not just the result of a single entity. The project would succeed if a group of organizations such as OMSAR, PCA, the Central Bank, the Ministry of Education, representatives of the media, etc. is formed to promote the above issues.

2.6 Increase PC Penetration

PC penetration goes hand in hand with Internet penetration. There is a need to increase this penetration, especially for those across the digital divide.

There is a need to reduce taxes on ICT equipment and related products (VAT or others). Moreover, PC penetration can be increased by implementing the various Solutions presented in the separate document which contains the comprehensive list of all Recommendations and Solutions. Such solutions as channeling donations, identifying and collecting second hand equipment, launching Multi-purpose Community Telecenters and other suggestions would meet this objective.

Furthermore, PC penetration can also be increased by encouraging various sectors to go online hence increasing the need to have PCs at home. Banking is the first to be considered. Other activities are mostly in eGovernment.

2.7 Improve Electrical Power Quality

One of the key concerns of computer users is the continuity and quality of the electrical power. Continuity in the main towns is an issue. This becomes a question of availability in areas outside the large towns. This is a national issue of concern and the recommendation here is outdated. Much has been said about this issue. However, its effect is still being felt by computer users namely, the increased costs needed to pay for UPS units and supplementary generator power.

A related but equally crucial issue is the quality of power and the regulations needed for its use. The following is recommended:

- Require buildings to have proper earthing as a third line.
- Require buildings to have lightning protection.

These two requirements will avoid excessive disruptions and costs due to damaged units facing unacceptable power fluctuations and spikes.

2.8 Increase Government's Yearly ICT Budget

Purpose: To slowly introduce spending on ICT as part of the regular government budgeting items and improve the adoption of ICT solutions in government work.

Description: Government spending on information technology has been rising over the last few years. Nonetheless, most of the funding for ICT has been originating from foreign aid and very little of the government's budget is dedicated to ICT.

In light of the need to be less dependent on international aid and to introduce improvement in the efficiency and effectiveness in allocating resources in government budgets in the future, it is important for the government to start incorporating ICT into the budgets as an item that would improve the services to the citizen. Evidently the use of ICT in government is not a temporary trend and chances are will increase in the future. Adopting it as part of the budget is a step forward to realizing its benefits.

To implement such a strategy requires various approaches. One of these would be to launch strategic ICT planning within each Ministry and Agency. This has been presented as a separate Solution. Another would be to concentrate on implementing eGovernment solutions.

2.9 Top Ten eGovernment Projects

Purpose: To launch 10 projects that would fall under the eGovernment initiative and that can be implemented without having to wait for the lengthy policy making process to end.

Description: eGovernment has been developed as a main initiative by OMSAR. A current law is being passed in the Council of Ministers. eGovernment projects can commence while the framework is being setup. It may be argued that such projects should be compliant with the policies and practices of such a framework. However, there are basic eGovernment projects that can be implemented without the need for such a wait.

Several eGovernment Solutions that are considered as critical have already been proposed in this document (Commercial Registry, Document and Transaction tracking, Citizen ID, etc). This Solution proposes a set of 10 (Or more) projects that can be part of the eGovernment initiative.

The following projects are proposed out of which the most suitable 10 will be selected:

- The Judiciary Record (Sijil Al Adli)
- Educational equivalence
- Family Register
- Vehicle registry and renewal
- Driving license application and renewal
- Bill payment: electricity
- Bill payment: telephone
- Bill payment: municipality taxes
- Applications for telephone lines
- Applications for power meters
- Applications for driving licenses
- Changes to the citizen status: marriage, birth, death, relocation, etc.
- Revenue collection for the Ministry of Finance
- Traffic violation fines
- Issue and renewal of passports
- Registry and renewal of residence and labor permits for foreign staff
- Issue and renewal of visas for tourists
- Transactions of the National Fund for Social Security for both companies and citizens.
- Military service transactions
- Health services
- Applications for public schools, vocational training and universities.

The above projects can be defined, evaluated, designed and implemented as part of this effort.

2.10 Encourage ICT Certification Programs in Academia

Currently, there are a few training companies that train students on ICT subjects that result in international reputed certificates (CISCO, Microsoft, etc).

The practice should be encouraged within the universities which have so far stuck to traditional computer science and engineering syllabi.

2.11 Encourage International ICT Exhibitions and Fairs in Lebanon

Purpose: To encourage regional and international organizations to conduct ICT exhibitions, conferences and fairs in Lebanon.

Description: Lebanon has always been a center for business services. In its golden days, Lebanon was always the host of regional conferences of interest to both the private and the public sector. Being a country with a strong tourism sector and a country that is strategically placed in the region, Lebanon should be a natural center for such events as:

- Exhibitions and fairs
- Workshops and seminars
- Corporate meetings
- Conferences

Such events are on the rise. These are mostly initiated by the private sector with little or no support from the Government. Lebanon would benefit from such activities in various ways such as generating an image of an advanced country, improving the productivity of the tourism sector and generally increasing spending by delegates and organizers in Lebanon. The ICT sector in particular would benefit by being exposed to emerging technologies as well as to be given the opportunity to connect with the outside world with the aim of increasing ICT exports.

The solution would require an entity that would be mainly concerned in the initial stages with promoting ICT events. However, given the right setup, there is no reason why such an entity cannot expand into other sectors such as industry, health, finance, etc. The entity would have the responsibility of defining the events and promoting them. In due course, organizing the events may be shared with the private sector.

As far as ICT is concerned, the Government is encouraged to do the following:

- Subsidize ICT exhibitions and conference in Lebanon
- Subsidize Lebanese presence in regional or international exhibitions by forming Lebanese Pavilions in such events.

This solution is tied in with that which proposes enhancing Beirut as a center for general training.

2.12 Capacity Building for Public Sector ICT Staff

Purpose: The aim is to keep the public sector ICT staff up to date with Government strategies, standards, and lessons learned.

Description: ICT staff employed in the public sector face the same challenges in their everyday life. Sometimes, one or more ministries or agencies are leading the way in technological innovation, but soon the other ministries or agencies will face the same problems.

The capacity building offered to ICT staff employed in the public sector has been technological in nature. The staff is proficient in Office Tools, database administration, and network management as needed by the function performed. The capacity building offered by this project addresses the implementation of technologies in government ministries and agencies.

The project offers cyclic training. The same staff attends once a month a training session of four hours and for the duration of one year. Every training session has a topic: leased lines and connectivity alternatives, intranets, directory divisions and domain assignments, maintenance and bug fixing, intellectual property rights and piracy, security, functional requirements analysis, data exchange, administration of the ICT systems, dealing with the administration and the suppliers, backup and recovery, documentation, etc. In this respect, the training topics are chosen in accordance with needs and problems faced.

Other topics are chosen in light of the government strategies. For example, when the use of ICT standards becomes an objective for the government, the implementation of a particular standard is chosen as the training topic.

Most importantly, the training sessions can be used to share lessons learned. The aim here is not to force all ICT staff to do all the things the same way, but to avoid reinventing the wheel or spinning the wheels unnecessarily.

2.13 Public Sector Data Definition and Exchange

Purpose: To setup a process whereby data that is owned by one Ministry or Agency can be made available, under specific conditions, to either the citizen or other Ministries and Agencies.

Description: This process is part of the Standards and Guidelines developed by OMSAR. The recommendations were made. The implementation project has not been launched. This solution covers the same grounds.

In the past, data exchange between two computer systems was carried out by technical specifications between the two ICT units that resulted in changes in the applications on both sides. The technical solutions were unwieldy and non-standardized. Communications were varied and non-standardized. The result was a general discouragement with such techniques of Electronic Data Interchange (EDI). A solution has emerged and is now becoming an international standard. It relies on the use of XML and Web Services. (This is discussed below).

A major stumbling block was the lack of legal frameworks allowing agencies to publish their work in such a manner that other agencies can use it in an official manner.

The main purpose of this solution is dual. On the one hand, it is critical for each agency to have clear ownership of its own data in a manner that is comprehensive, complete and totally valid. On the other hand, it is also critical for this agency to publish its data for others to use, under specific conditions.

The technological solution was discussed in the Standards and Guidelines documents and is summarized as follows.

Step 1: The local data or the data within a specific Ministry or Agency that can be published needs to be identified. For example, the Ministry of Interior would be recognized as the owner of the Citizen ID and the Judiciary record.

Step 2: The Ministry or Agency that identifies its own data would then present this data dictionary to an entity to be established such as a national Data Exchange Control Board. (DECB). The board has the responsibility of verifying the validity of the data and the completeness of the definition. Once that is approved, the data becomes officially publishable.

Step 3: The Ministry or Agency that has an approved set of data elements to be published can now prepare the necessary technical setup for publishing this data. This is achieved by using **Web Services**. Web services allow organizations to communicate

data without intimate knowledge of each other's ICT systems behind the firewall and without time-consuming customized programming.

Web Services is a technological standard that defines how web based applications can exchange data using XML, SOAP, WSDL and UDDI open standards. XML is used to define and tag the data. Because all communication uses XML, Web services are not tied to any one operating system or programming language. SOAP is used to transfer the data. WSDL is used for describing the available services and UDDI is used for listing what services are available. Using the above approach reduces communications and development costs.

Step 4: An agency wishing to check or authenticate a specific record can now handle its own development using the available Web Services without needing to consult with the originating agency. Conditions restricting the use can be built in to ensure that only authorized parties can access the data.

The above data exchange solution can be used in various solutions such as:

1. Publishing data in the public domain: statistics, information regarding projects, etc. These can be published in a manner that citizens, companies and public sector agencies can use. For example, a company can import into its system a variety of information published by the Central Administration for Statistics.
2. Using inter-agency data to authenticate records: all the registers discussed in a separate Solution such as the Citizen ID, educational levels, real estate, etc.
3. Using inter-agency data to inquire about specific information. Invariably, companies, citizens and public sector agencies require information found on databases within the Government. Examples include banks requiring an analysis of the real estate ownership of a loan applicant or a doctor may inquire from the Ministry of Health the medical history of a particular citizen.
4. Complete workflows that require hopping from one agency to the other. An example is when applying for a Trade Mark. At some point, the citizen is required to collect information from the Ministry of Economy and Trade and publish the request in the Official Gazette. Such a step can be avoided by having the Ministry forward the request directly to the Official Gazette using the published Web Services of the Gazette.

The benefits are many and are crucial. They lead to transparency, flexibility, efficiency and accountability.

2.14 Promote and Improve Lebanon as a Training Venue

Purpose: Regain, improve and promote Beirut as a center for regional training.

Description: Training has become a major sector in the region. Various training companies have proliferated. Some are indigenous and others come from abroad, mostly England and the USA. The training areas cover the following:

- Technology at the managerial level
- Technology certification courses
- Office and administrative skills

- Management
- Business
- Etc

Traditionally, Beirut was a center for business services. After the war, Dubai took over. It currently offers many facilities that are attractive to training companies as well as to their customers.

Regional countries have invested heavily in the training of their citizens, particularly in the public sector. Invariably, training companies are interested in taking their attendees out of their respective towns. The main targets have been Cairo, Amman, Beirut and Europe. Sometimes, training in the Far East is also undertaken. Beirut is a preference to most companies. However, these considerations challenge such companies and they turn away from Beirut:

- High cost of living in Beirut
- Lack of suitable training venues
- High hotel costs and even when those are suitable, they do not have the proper training facilities

The current trend is for regional companies to bring their customers to Beirut. Very few Lebanese companies have ventured into the marketing of material to the Gulf countries where the venue is Beirut.

As part of re-instating Beirut as a center for Business Services, this solution aims at setting up the necessary factors needed to attract Gulf training to Beirut. Two major drives are needed:

First of all, there is a need to initiate and support a Professional Training Association, along the lines of the PCA. Its purpose would be:

- To develop the training sector for both local and external consumption
- To consolidate its efforts to market abroad both its own material as well as Lebanon's facilities
- Establish the training requirements and attempt to develop suitable material
- Identify venues that can be used for training that are professional but at the same, offer attractive prices. (For example, Berytech, the Engineers Syndicate and various Universities have excellent theater based facilities. Yet these are never promoted).
- Develop a consolidated web site that promotes local training and all facilities that can be used by regional companies.
- Unify pricing schemes to make them attractive to regional companies and individuals.

As a second initiative, the Government should offer similar incentives to general training companies as presented in the solution that proposes such incentives for ICT training companies.

Thirdly, the Lebanese government should encourage international companies to carry out their training in Lebanon.

Finally, the Government should tie this solution with that which proposes setting up Beirut as a regional center for Exhibitions and Fairs.

2.15 Implement Centralized/Decentralized Databases

Purpose: to increase the efficiency of exchanging data between Ministries and Agencies.

Description: Manual systems are by nature centralized. This eases control and update. However, the strong ownership of the data stands in the way of decentralizing it for others to use. The solution proposes means to maintain the advantages of a centralized system by decentralizing those aspects that were traditionally withheld from other agencies.

It is important to state the problem first. For the citizen, one of the most tedious aspects of dealing with public sector procedures is the way agencies off load their work on the citizen. Examples are necessary to confirm this:

Example 1: Many agencies require authenticated documents. It is always the responsibility of the citizen to secure them. Most of these documents are available within the same Agency or with another. For example, if an ICT Professionals Society is to be setup, an application must be presented to the Ministry of Interior. Along with the application, the applicants must present an authenticated copy of their ID or register (Ikraj Qaid). Another requirement is to present an authenticated copy of the Judiciary Record for each applicant (Sijil Adli). Both these documents are issued by the Ministry of Interior itself, yet, it is the responsibility of the citizens to visit different offices in different locations to get them.

Example 2: When registering a trade mark, the Ministry of Economy and Trade requires the applicant to pay the charges. The applicant has to go to the Ministry of Finance to pay them as there is no collection mechanism for a simple charge within the Ministry of Economy and Trade.

Example 3: When updating any information about a company in the Commercial Register in the Ministry of Justice, the department requires a clearance (Bara'et Zhimmeh) from both the Ministry of Finance and the National Fund for Social Security.

The nature of the problem is simple: standard data is not available for other Ministries or Agencies to use. In many cases, the data is not available in an automated form. In others, it is not setup for exchange. The setup is neither covered legally nor in technological terms.

The solution consists of a hybrid centralized/decentralized system with 3 stage approach:

Stage 1 covers a major initiative to identify key data that is commonly exchanged and required between agencies and automate the systems that set it up. For example, without going to major lengths to automate all that is available about the citizen, it is enough in this stage for the Ministry of Interior to automate the ID register so that the whole population of Lebanon is clearly and correctly setup. (See further down for a suggested list of initial automation projects).

Stage 2 covers the activities needed to legalize the regulations needed for exchanging data. For example, the proper laws must be issued to ensure that the Ministry of Education can access the database of the Ministry of Interior and authenticate the ID of an applicant for specific types of applications.

Stage 3 covers the activities needed to automate the exchange. This exchange is part of a separate Solution. The solution can be summarized as follows. The Government needs to establish a Data Exchange mechanism. This mechanism consists of 3 major activities. The first is to identify the information that can be published to other Agencies such as Citizen IDs, Educational Diplomas, commercial registry data, driver licenses, car licenses, etc. Secondly, each agency will be required to make available such data through the proper technological interface. Thirdly, each agency wishing to use the published data must submit a request to a board that can validate the request and permit it. From then on, the requesting agency can produce the necessary authentications.

This solution has major benefits:

- The most important benefit is the vast reduction in the steps needed to complete procedures in the government. Many of these steps require authentications which can now be automated.
- Another benefit would be the reduction of the burden on the citizen, easing his or her life.
- The process of streamlining the data itself is crucial. Currently, most registers are kept in manual form, risking spoilage and errors.

The risk in this approach is that Ministries and Agencies consider themselves the sole owners for their own data and hence cannot view any other agency using them. The proper legal framework must be implemented with this in mind. Ministries and Agencies should consider their data as beneficial to others.

The following registries are proposed. In due course, the project implementing this solution will need to identify different registries:

- The citizen ID at both individual and family levels
- The judiciary record of each citizen
- Educational levels
- Commercial registry data
- Real estate register
- National Fund for Social Security register
- Vehicle registrations
- Driving license registrations
- Government employee register
- Payments to the Ministry of Finance which necessitate publishing accounting headings

In the future, and after the overall solution is implemented for various main registries, citizens may be allowed to view part of this data that is of concern to them.

2.16 Free Information Access Points

Purpose: To provide free Information Access Points (IAPs) throughout the country.

Description: The project will build on the success of the PCA's PiPop program and other sporadic initiatives to provide free Internet access points throughout the country.

It should be conceivable that Internet free access points are a public service in the same way that public phones are. The Internet access points are either totally free of charge or charged on a nominal hourly rate that should be lower than the rate already

established by Internet cafes (\$0.75/hour). The charge will cover telephone, network and ISP usage.

The access points should be available in every Lebanese village and in each neighborhood in cities. The location of the access point depends on the readiness of the village. The following locations shall be considered:

- Community Telecenters
- Municipalities
- Post offices
- Public or private libraries
- Universities and high schools

Free Information Access Points are a necessary requirement for the spread of ICT and the Internet throughout society. Furthermore, these would be a pre-requisite for the citizens to take advantage of the ICT programs and portals being implemented under other initiatives such as eGovernment, unemployment bank, distance learning, etc.

The usage of the free Information Access Points will determine their future need and expansion rates.

2.17 Develop Women Based Cottage Industries

Purpose: This solution aims at providing promotional, technical and financial support to units of women engaged in small scale and cottage industries and to attract more women entrepreneurs into this sector.

Description: Cottage Industry means a small industrial unit either engaged in manufacturing or servicing generally run by family members either as full time or part time with a very limited total investment.

Women have always had products that they produced in between their traditional chores. Such cottage industries have often been promoted on an individual basis.

The purpose of this Solution is to create a cooperative that has its regional centers with the main aim of promoting the work of such women.

Products such as the following can be considered:

- Food items: fresh and conserved
- Clothing items
- Handicraft
- Flower / plant production
- Bottling and canning of natural products
- Special purpose products: bee keeping, etc.

The solution covers such efforts as:

- Carry out gender sensitization workshops for traditional organizations that may interface with the work of such women
- Establish cooperative societies for women in rural areas
- Provide training on related industries
- Organize workshops on income generation for women and youth

- Establish a work place nursery to cater for children between the ages of 1 and 4 years to cover for time spent on such industries
- Established drop in centers that can host women who prefer to work outside their own home or for those requiring special purpose equipment found in such centers.
- Assist representatives of such units to participate in exchange programmes other units
- Provide micro-lending facilities to such units to facilitate acquisition of equipment, training and material.

The ICT component in this solution will be in the form of promoting the produce of the various units as well as allowing direct purchases online. It can also be used for the setup to allow women to apply for micro-lending.

2.18 Encourage Foreign Direct Investments in the ICT Sector

One of the problems of the ICT sectors is the lack of proper investment. Companies start small and struggle to grow in a small competitive market. It is therefore difficult for them to grow to the level needed to start contributing to the economy, export their products and be innovative.

Secondly, FDI usually brings with it experience and technology transfer well needed in Lebanon.

Funding is hard to come by. However, in the recent past, some ICT companies have succeeded in acquiring Foreign Direct Investment (FDI) through capital sharing, joint ventures and direct support.

The Government can encourage FDI through its various economic incentives. Furthermore, the various Solutions presented in the comprehensive list cover such a need.

2.19 Virtual / Open University

Purpose: To give the already good reputation of Lebanese universities in the Arab world a new dimension. Improve access to higher education to both Lebanese and Arab population.

Description: The concept of the Arab Open University (AOU) has been promoted by HRH Prince Talal Bin Abdulaziz, President of the Arab Gulf Program for United Nations Development Organizations (AGFUND). Roots of the concept go back to early nineties. Following a feasibility study made by Arthur Anderson and a subsequent standing collaboration with the United Kingdom Open University (UKOU), the AOU was established under the umbrella of the AGFUND.

The University was supported by all Arab countries represented by the Arab ministers of Higher Education who recommended the project and gave all their support to it in their meeting in Beirut in the year 2000. AOU in Lebanon was established by government decree n° 3257.

The university has already started with a mix of online and in class curricula.

Curriculums could later be developed to provide four-year undergraduate programs in a number of different areas of interest. Currently, the courses tend to be technological in nature. In due course, with proper support from the Government, this university can be expanded to provide other subject matter that caters for local and regional requirements.

It is intended that the University would eventually become a hub for academic institutions of higher education through the Arab world.

2.20 Develop Specific eLearning/CBT Content for Lebanon

Purpose: To promote education at different levels by developing eLearning and CBT material that concentrate on Lebanese content.

Description: eLearning and CBT have proved their worth and material using both technologies is available in a variety of educational areas. However, there is little that concerns Lebanon except a few multi-media CD-ROMs issued in the past. Effort has not continued in this area. There is therefore poverty in such material.

The audience for such material is the disadvantaged population that is on the lower side of the digital divide: the poor, the rural areas, the young and the old. Developing eLearning sites and CBT material would cover such a lack. The material can be broken down into several categories:

- Material to cover formal education such as language learning, vocational material, primary school material to interest children, etc.
- Material to cover general knowledge related to Lebanon such as history, geography, cultural and heritage material, social and economic reviews, etc.

The technologies are available today and can easily be developed by an entity that would have both technical and domain expertise. Given generic enough development, some of the material can be of use in the Arab countries.

The material can be disseminated through the following channels:

- CD-ROM
- Web site interactive form
- Packaged with donated PC kits
- Installed in Community Telecenters

The main challenge of this solution is the task of selecting and developing the products. An effort should be made to avoid past experiences of involving councils and committees as that would dilute any initiatives and delay the process. The burden should be thrown on the shoulders of the private sector along with incentives to create suitable products of the required quality.

2.21 Combat Illiteracy through Computer Based Training and eLearning

Purpose: To combat illiteracy in its various forms through Computer Based Training (CBT) and eLearning.

Description: To reduce the level of illiteracy, especially in rural areas, by providing on demand facilities. The project would also be an empowerment opportunity for some vulnerable groups, especially girls and women. This would also facilitate the ability of the learner to be engaged in a wider range of income generating activities.

The range of learning can cover such issues as:

- Support to formal education (Primary and secondary)
- Beginner, intermediate and advanced Language training (Arabic, English and French)
- Acquisition of various skills
- General knowledge such as history, geography, economics, etc.
- ICT related subjects

Key to the success of the project would be the development of such material in Arabic. However, in order not to re-invent such material, a major thrust could be through the identification of useful material developed in other languages and proceed with its translation. (Review the separate Solution that proposes surveying such software).

The media for the above training would be developed using standard web based interactive training. (Already, the Arab Open University is using Blackboard for such training. There are other platforms). Being web based would allow the material to be disseminated on the web as well as on CDs for offline use.

The software would be setup in a number of places including municipalities, community centers as well as other commonly accessible facilities. The focus will be on mostly on rural areas as the rate of illiteracy is much higher than urban areas. It can also be distributed free of charge on CDs or bundled with PC donated by various parties. (See related solutions on donations and second hand equipment).

The challenge of this solution is the coordination of the various parties required to develop the content.

The solution should be strongly coordinated with that offering Lebanon specific content.

2.22 Use Media to Promote ICT

Purpose: To use Radio and TV to promote ICT in various ways. Education would be a key aim. Furthermore, this would ultimately create new interest in the field and encourage entrepreneurship and creativity.

Description: One of the main findings of the eReadiness Assessment was the disparity between Beirut and the rest of the governorates in terms of PC penetration and therefore Internet access. This puts the rural areas and even the urbanized areas outside Beirut at a disadvantage. Since Radio and TV are quite accessible in such areas, they can be used as the medium for promoting ICT.

The aspects of ICT to be aired are the following:

- Educational material that introduce PCs, the web and related technologies to the young, the uneducated and the distant professionals.
- Educational material that introduces technologies of use to various sectors such as health, education and agriculture.

- Promoting web sites that have interesting content for such areas
- Promoting ICT events
- Supporting Ministry of Education ICT syllabi.
- Supporting ICT certification programs
- The latest trends in ICT
- Exposing ICT experiences in developed and regional countries.
- Promote the organizations that have shown ICT excellence or have won awards in this field. (Developed in another solution).

The show will also host both local and international guests that work in the field, enabling field, and users of technologies. There would be a focus on Lebanese products, inventions and successes.

The solution can depend on the private sector to a large extent as they would benefit from the additional exposure. However, the Government should back up the solution by reducing airing costs.

2.23 ICT Research and Development Centers

Purpose: To establish a research and development center for ICT.

Description: R&D is an activity historically reserved for government, academia and large corporations. R&D has not been part of the Lebanese business culture because most companies are small or medium enterprises (SMEs) and cannot take on such an activity.

Based on success stories of a few individual Lebanese citizens and the success of the Lebanese Diaspora in the field of research in the developed countries, it is highly reasonable to assume that such a center would thrive and produce innovations if implemented in Lebanon.

A reasonable goal for this project would be to have a Public Private Partnership between the Lebanese government and one or more established universities covered by sponsorships from the private sector. The partnership consists in providing sustainable funding to the center through the identification of key research topics.

The research could be funded through grants, awards and support from the private sector and the government.

The following are potential areas of interest where research is much needed:

- Security and encryption technology
- eCommerce applications such as the development of web components and the management of the systems.
- Application Service Providers
- Specific products for the Arabic language such as: Arabic text to speech converters, Arabic speech commands, OCR (Already one product exists), online translators, etc.
- Converging technologies that relate such varied establish technologies as GSM, WAP, communications, the Internet, etc.

The researchers can benefit could be rewarded by spinning off their findings into the private sector giving them the incentive needed for such a venture.

This solution can be related to that establishing an ICT Excellence award.

2.24 Standardize and Spread the Use of GIS

Purpose: To provide an agreed upon set of maps that can be acquired by the general public. The purpose is to allow the public and the private sector to cut short the effort needed to prepare and use such maps.

Description: GIS has been successfully applied in various situations in Lebanon. Private sector effort has ensured such successes with some public sector agencies. A committee has been setup representing various stakeholders. The maps have been developed by the Directorate of Geographical Affairs in the armed forces. The DGA is part of this committee.

The following issues remain:

- Maps of Lebanon are incomplete for different usable scales
- Ownership of the maps is not clear as various parties are using different sets
- Lack of support for their use
- Lack of standardization on the use of the maps both at the application level and at the coordinate conversion system level.
- Lack of coordination at the application level

The above problems can be resolved through the following solution. The Government needs to open up and liberalize the GIS data. This can be achieved by centralizing the task of maintenance and updating of the data. The center would also provide support for the use of such information. There may be added revenue to the Government if the use of such maps is chargeable. This should be a nominal non-prohibitive charge.

GIS solutions can then be spread over various institutions with the knowledge that the maps are standardized. Another benefit of the wide spread use of such maps is that in due course, various agencies may be able to merge data collected as layers over the maps and arrive at relevant decisions. For example, it may be of major benefit to link transportation GIS applications with school distribution.

2.25 Widen the Use of the Global Positioning System (GPS)

Purpose: To promote and make available the various services provided by the Global Positioning System.

Description: The Global Positioning System (GPS) is a Satellite Navigation System funded by and controlled by the U. S. Department of Defense (DOD). While there are many thousands of civil users of GPS in the world, the system was designed for and is operated by the U. S. military. GPS provides specially coded satellite signals that can be processed in a GPS receiver, enabling the receiver to compute position, velocity and time.

Civil users worldwide use the SPS without charge or restrictions. GPS receivers are needed to receive GPS signals. Until recently, civil users could get no more than the following accuracy: 100 meter horizontal accuracy, 156 meter vertical accuracy and 340

nanoseconds time accuracy. Recently, the DoD lifted its restrictions and much higher accuracies can be used such as 1 cm horizontal accuracy.

This has brought out GPS into prominence.

In Lebanon, the Center for Remote Sensing is part of the National Council for Scientific Research. It has been carrying out a wide variety of research and applications in GPS. The center relies on a GIS application for the analysis of its data.

Its applications are many and can be directed at various socio-economic usages.

The following recommendations are made:

- Currently, there are 25 primary geodesic points (Reference points) mapped and around 200 secondary points. These need to be expanded.
- The use of various applications and equipment need to be standards, at least in the public sector.
- A more healthy GPS usage will result with the wider use of Geographic Information Systems (GIS) as proposed in a separate Solution.

The following solutions can then be envisaged:

- Comprehensive hazards management covering such areas as natural hazards, floods, earth quakes, buildings, mass movements, coastal floods.
- Environmental applications identifying garbage dumps and other polluting centers
- Surveys of all quarries and their proposed relocation
- Fleet management by both public and private sectors
- Mapping of agricultural area by the private sector.
- Mapping of agricultural areas for government subsidized agriculture produce such as wheat and beat root.
- Marine applications for safety of ships and boats

A wide campaign of GPS awareness should be launched to introduce both public and private sector organizations to the technology. Currently, several private sector companies are already trading in GPS equipment and services. These parties can be involved in such an effort.

2.26 Prepare Lebanon to be an ASP Center

Purpose: To provide the necessary environment that allows Lebanon to host applications on the web that can be promoted and used by regional and international customers.

Description: ASP means Application Service Provider. This consists of the setup of key software applications on a host. Customers would then access the applications through the web by paying monthly charges rather than face large investments for one time licenses.

For the ICT department, using ASPs would mean reduced support cost, pay-per-use or subscription-based price flexibility, continuous access to upgrades and the ability for users to run the product anywhere, no matter what computer they happen to be using. A tedious task facing an ICT department is that of installing and supporting applications. This would disappear when using ASP based applications.

Setting up Lebanon as an ASP base would have large benefits mainly in the inflow of funds from regional and international customers. However, the solution itself is strongly dependent on suitable bandwidth. The cost of such bandwidth is currently prohibitive, raising the end user price of ASP usage. Secondly, such a solution would require regional marketing and support during initial implementation.

The Government can reap benefits from such a setup in terms of increased export. Secondly, Lebanon would be poised as a high technology environment improving its image and increasing the productivity of the ICT sector. The Government can encourage such a solution by reducing telecommunications costs and providing incentives and exemptions to companies that venture into such a technology.

2.27 Deregulating Telecommunications

Purpose: To remove the existing laws that force unnecessary regulations on Telecommunications services and usages.

Description: The telecommunications law number 431 was issued on 23 July 2002. The law provides for the establishment of the Telecommunications Regulatory Authority to review and restructure the whole telecommunications industry within two years. The law also calls for the privatization of the telecom industry through the establishment of "Liban Telecom" to operate the telecom sector. Twenty five percent of Liban Telecom will be sold in an initial offering and forty percent within the first two years. The law does not provide for the rate and time frame of the privatization of the remaining shares.

Although the law was passed in July 2002, it has been inactive since. A project sponsored by both the Ministry of Post and Telecommunications (MPT) and The Office of the Minister of State for Administrative Reform (OMSAR) was launched in January 2003. The project is funded by an EU grant. Its aim is to help MPT in establishing a Telecommunications Regulatory Authority. The project will be executed with Eurostrategy at a cost of USD 3.5 Million. The project has a duration of three years.

The Telecommunications Law requires the use of permits for data providers and ISPs. It is expected that this law shall resolve issues related to piracy of cables, microwave links and satellites within an open market approach. It is hoped that the Telecommunications Regulatory Authority will view communications as a consolidated service and that the practice of licensing bits and pieces will be addressed.

Lebanon needs to proceed in the path of deregulating its telecommunications sector. Currently, services such as mobile telephones, wireless services and others are regulated. Furthermore, there are many restrictions on the use of telecommunications standing in the way of an open sector. As a comparison, ISPs were not as strictly regulated as the other services which resulted in a stabilization of services in terms of quality, range and price. The rest of the sector should follow example.

Deregulating telecommunications has the following advantages:

- Increased privatization, a trend that is being observed by a large number of countries, Lebanon included.
- Removal of regulation limits on various telecommunications services will increase the number of players, improving the economy and eventually result in the stabilization of the sector.

- Increased competition, which is not available at the moment, would improve services, widen the range of products and services and stabilize pricing.
- Converge services so that customers will deal with single parties and will have access to a range of telecom services that are under the control of one party.
- Deregulation opens up the sector to foreign investment which has financial and operational/technological benefits.

Deregulation is a long process. It is recommended within the National eStrategy as a Program and needs to be implemented over a properly planned set of stages.

3.0 Solutions

Solutions are specific projects that can be implemented in a single step. The Programs identified in the previous Sections may consist of several projects. The following Solutions are not related to those Programs but independently address issues in the 7 initiatives.

3.1 Lebanon Competency Center

Purpose: To setup a competency center in Lebanon where new technology can be reviewed. Furthermore, the center will allow participants to have hands on training on the new technologies.

Description: One of the key problems with ICT is the constantly changing nature of its technologies. The impact of such changes is wide and costly:

- In order to remain up to date, companies will need to expend major efforts and funds on their own.
- Professionals are not always capable of keeping up to date on their own.
- Vendors promoting the new technologies have a hard time convincing prospects of the facilities and benefits of the new technologies.
- As many of the new technologies are inter-operable, it is often unlikely that such technologies can be experimented with without strong coordination between different vendors.

The solution to the above challenges is to setup a Technology Competency Center (TCC).

To facilitate the services of the center:

- The center will be funded by a group of vendors, much as the Professional Computer Association is.
- It will be supported and encouraged by the Government through subsidies, exemptions and incentives.
- It will be supported by various donors with interest in development in Lebanon
- It may be located in such centers as Berytech or IDAL's BETZ park

The TCC will have the following facilities:

- An ongoing stream of lectures, workshops and conferences on new technologies
- Installation bays that have full setup of the new technologies with the requisite staff needed to demonstrate them and respond to the public.
- Sessions can be booked by various organizations in the private and public sectors to have hands on experience on such technologies. These will be conducted by the vendors and will vary in duration and depth according to the requirements of the companies.
- Coordination between various vendors will be a primary condition to cover cases of inter-operability.
- On a regular basis, and because it is difficult to move the whole center to towns outside Beirut, two facilities can be provided. Specific road shows can be setup that will tour Lebanon. Secondly, a drive can be launched to schedule tours from distant towns to the center whereby transport will be provided.

- Students needing specialized ICT setups to complete projects, theses or experiments can use the center. Such work can be completed in coordination with vendors who may find such students as suitable candidates for later recruitment.
- Remote centers all over Lebanon can use leased lines to connect to the center and use the available facilities through various Terminal Services.

The center will be supported by a web site announcing all its activities and promoting its facilities.

3.2 Activate and Speedup Online Banking

Purpose: To encourage Banks to provide a wide range of transactional services on line. Another objective would be to improve operations between banks as well as with the private and public sector.

Description: Currently, very few banks in Lebanon provide transactional or other services online. The benefits as shown below are many. Furthermore, there is a danger that foreign banks providing such services may usurp Lebanese accounts.

The Central Bank needs to speed up the following:

- Encourage all banks to convert their currently manual services to online transactional services.
- Implement a real time cheque clearance system to avoid delays in check clearance often amounting to 7 days.
- Encourage users of online banking by removing all charges related to such use. Currently, banks charge users per ATM transaction knowing full well that such transactions reduce the costs for banks. Again, Lebanon is hit by the approach of "Increase charges to increase revenues". The reverse may be the case here as many banks are still facing walk in customers that only require cash withdrawals.

Consider the large number of account holders in Lebanon. This is a key target for Internet usage and would result in a proper and increased usage of the web.

If most banks provided online services, the following benefits would result:

- This would generate a need for using the Internet as a convenient 24/7 service. The citizen would benefit from such a service in the same manner as when ATMs were introduced. However, the benefits are wider and more pronounced.
- The large number of account holders converting to web based services would result in an increased Internet penetration.
- Cost reduction to banks. It has become a platitude to say that an ATM transaction costs 10% of a manual one and that an Internet transaction costs 10% of an ATM transaction. Though such a statement has not been substantiated, it has been corroborated by the wide spread of online banking. More and more banks in the west are now charging their customers for transactions carried out in the bank's premises.
- Improved online banking by Lebanese banks would avoid the penetration of the sector by non-Lebanese banks and would protect the sector.
- Reduction of costs on the private sector. As in other solutions presented in this project, the aim is to reduce the costs on the private sector which can be reflected as a reduction in the cost of living.

The challenge of such a solution is mostly a legal one. The Central Bank is already on its way towards developing legislation that covers eSignatures, eTransactions and resolving a wide variety of legacy issues such as authenticating statements, etc.

Secondly, the issue of security and confidentiality must also be addressed.

3.3 Multipurpose Community Telecenters (MCTs)

Purpose: To setup a large number of community centers available to all citizens. These would be more densely distributed in the rural areas. They will have a variety of electronic services supported and available at no charge to the citizens.

Description: Multipurpose Community Telecenters have proved their worth in various countries around the world, more so in countries where there is a wide digital divide than in more developed countries. Citizens living in remote areas in Lebanon would probably have neither the means to travel to the larger towns to complete their transactions nor would they have access to their own electronic services. Providing a CTC in most small towns and villages would redress this situation.

MCTs can be owned by the community or shared with public sector agencies. They can be of several different formats often customized to suit the requirements of particular communities.

The concept of the CTC is one of a communal location, often housed in a separate flat or hall. Municipalities, schools or public libraries could be their host.

The following services could be provided:

- Access to telecommunications services: fax, telephones and email.
- Internet Access
- ICT literacy training
- eGovernment services through Citizen Information Offices consisting of direct or web based access to public sector information and transactions. Citizens can then complete full or part procedures online in the presence of government support personnel.
- Supply of various government forms and procedure guides (Manual or web based)
- Consolidated one stop access to all sites of relevance to the community (Mostly proposed as separate Solutions).
- Video/TV setup for educational and training material
- Publishing the communities' own information online: job opportunities, events, achievements, news, public announcements
- Connecting cooperatives with their target markets and suppliers
- Distance or eLearning
- Distance health care
- Small and micro-enterprise support
- eCommerce link to wider markets
- Market information for farmers and local cottage industries
- Participation in the political process through election campaigns, government news and publications
- The use of the centers for collaborative projects between schools and the community

These services provide a foundation for the empowerment of rural citizens, as well as numerous economic opportunities.

The following are some critical success factors for MTCs:

- Secure government and private sector subsidies
- Incorporate Telecenters into a comprehensive economic and rural development strategy that includes investment in complementary sectors.
- Target youth for ICT training since they are quick learners with the longest productivity horizon. (Schools can either serve as community learning centers).
- Encourage communities to take the initiative and be responsible for maintaining community information systems.
- Staff to be trained to help visitors become familiar with the technologies, resources and services offered at the Telecenters
- To ensure long-term sustainability, fee and management structures can be established based on the ability to pay.

There are many challenges to this Solution such as funding, training of staff, sustainability of result and the encouragement of the use of the MCTs. However, given the number of challenges they resolve, they are a key step towards bridging the digital divide, reducing poverty, improving the democratic process, reducing urban migration, increasing literacy and empowering the citizen.

3.4 Audio Video Streaming for Mobiles

Purpose: To encourage mobile operators to provide audio video streaming services.

Description: Technologically, the transmission of audio and video has always been a forbidding issue due to the heavy bandwidth required for such information. However, in the recent past, a technology was introduced which resolved this issue. Streaming is a method for the delivery of audio or video signals to a computer over the Internet. Instead of downloading a file, data is converted to a form that is transmitted over the Internet and reconverted on a PC. Users can listen or view a clip without having to store the data on their PC. It is online and much faster than downloading a whole audio or video file. Users have control over the stream. They can pause, move back or forward, stop at any time.

Recently, this technology has been converted to supply streaming audio or video onto mobile telephones.

Some countries in the region, such as Kuwait, have just embarked on the use of this technology for transmitting various content to mobile users. The main targets are youth and business. Youth will use it for traditional interests such as games and music. More importantly, this technology is being targeted to organizations that wish to provide information to their customers, remote forces and employees.

The key issue here is that mobile penetration has already reached its licensed limit in Lebanon. Given additional operators or a relaxation of the licensing limits, mobile penetration is expected to reach high levels. Kuwait, for example, has reached 60% penetration although the ITU has set its level at 23% in 2001. This increase is due to reduced charges and wide spread acceptance of mobiles.

Lebanon can benefit from such a technology as an alternative mode for providing information. Such uses as the following would be beneficial:

- Government announcements
- Content related to key issues of interest such as health and other government services
- General information such as weather, road conditions and traffic.
- Media summaries

Used by the private sector, this technology would provide more efficient modes of communicating information between its office and its remote employees.

The challenge here is to reduce the cost of the mobile services. This is an ongoing issue in Lebanon.

3.5 Implement Terrestrial Cable Network

Purpose: The purpose is to develop a Terms of Reference for BTO licenses for third parties to provide broadband terrestrial cables to residential neighborhoods.

Description: Terrestrial coaxial cables are very popular abroad. They are the number one means for broadband access in the United States. Terrestrial coaxial cables are the backbone of the digital network. If one thinks of the World Wide Web as a utility such as water and electricity, terrestrial coaxial cables are part of the infrastructure needed for households and businesses. In addition to Internet access, coaxial cables can provide cable television and other digital services such as film on demand, high definition TV, local shopping, home delivery, etc.

The advantages of terrestrial cables are many:

- They are environmentally clean.
- They are not visible
- They do not cause any hazard for public health and safety.
- They are reliable and provide high bandwidth.
- They can be hooked to digital TVs and other devices so households do not need to have a PC to access the web.
- Terrestrial cables can help legitimize cable TV, since Lebanon is on the Intellectual Property Alliance's (IIPA) Priority Watch List mainly because of cable piracy of movies and music.

The project can be carried out in several stages:

Stage 1: A technical feasibility study can be carried out to determine technical specifications such as points of entry, conduits to use, the gauge and material of the conduits, the type of cables to use, how often to repeat signals, how to label the points of entry to buildings, etc.

Stage 2: Identify the legal framework for the project and government entities impacted by the project. Revise the related laws and regulations and speedily implement them.

Stage 3: Identify two neighborhoods. One would be residential and the other containing a large number of office blocks. The pilot project would then be executed and monitored

for its feasibility. The feasibility study would then be extended to arrive at a national project for such a network.

Stage 4: On deciding that the project is feasible, terms of reference can be issued for a large number of companies that can proceed with the implementation stage.

The challenge for this solution is the first time installation cost. It is high. However, as in the land line telephone network, a major network can be used for a long time and does not stand the change of getting obsolete.

3.6 Public Notary Services

Purpose: To make the services provided by Public Notaries (Kateb Adl) more efficient and accessible.

Description: The Public Notary in Lebanon is a key service providing citizens with a variety of authentications, proofs, certificates and powers of attorney. So far, this service has been manual and has not been automated. A few notaries have started using templates but are still not very well versed in computer skills.

The project can be implemented by the Ministry of Justice.

The Solution proposes the following:

- Development of standard templates for use by public notaries
- Training schemes in basic computer skills
- Funding their automation effort through direct subsidies or donations
- Assisting and training notaries on the access to key eGovernment sites as and when these become available.

In addition to the above, the Ministry can develop a standard or generic web site that can be acquired for use by the Notaries. Each notary who has a web site may be able to accept applications for work from the citizens whereby the Citizen can fill in all the required information at his or her own time and place. This would speed up the various procedures to be transacted by the Notary in question.

Finally, Notaries will benefit from other Solutions, specifically that of Authentication as a major effort expended in their offices is authenticating documents coming from various sources.

3.7 Educational Career Counseling

Purpose: To setup an entity that can provide such counseling to high school leavers entering universities as well as to career paths for university leavers.

Description: To many high school leavers, the world is just a wide mass of possibilities that is confusing and risky. Matching the capabilities of a student with a possible university specialization is often a matter of peer and family pressure. Proper educational counseling needs to be made available to high school leavers on the point of entry into universities as well as to university leavers on the edge of employment.

This Solution proposed the setup of an entity that can carry out such activities:

- Launch regular workshops and exhibitions that provide information on such issues
- Rotate the workshops so that they can present their material throughout the country
- Encourage both public and private sector institutions to provide speakers and material highlighting various career paths
- Provide connections to individuals who are ready to take such counseling a step further to direct face to face talks
- Carry out salary surveys for particular job types to prepare the students for their later years

Secondly, a web site needs to be developed to provide such information:

- Classification of careers and a presentation of their benefits and educational requirements.
- Provide a breakdown of all specializations in Lebanese universities with further links to their sites
- Collect a set of case studies in each specialization
- Discuss the advantages and disadvantages of local education as opposed to that carried out abroad
- Launch a forum for specific specializations so that student and professionals in that field can exchange views.
- Present the specific education requirements needed by Lebanese professional associations, syndicates and orders.

Finally, coordination needs to be made with the National Employment Office to present a good analysis of the job market. This would direct students to careers that are in demand and that have not been saturated.

3.8 Launch Project/Entity to Gather and Publish ICT Data

Purpose: to setup an entity within the Lebanese Government that is responsible for gathering and publishing data about the ICT sector.

Description: The ICT sector is the economical base of the digital economy. This small sector is rapidly growing. However, the growth is unfocused. Knowledge about the sector is poor because there is a general lack of information. Planning and monitoring the behavior of this sector are therefore not possible as with other major sectors in Lebanon.

One of the main problems faced in the National eStrategy project was the lack of reliable and up to date data about the ICT sector. Various sources provided contradictory and unsuitable data. It is important to maintain data about the ICT sector as it would help both the private sector and the Government know about its challenges and opportunities.

ICT companies are not homogeneous in nature. It encompasses the communications giants as well as the whiz kid working from his garage. ICT companies include mobile operators, software developers, handset retailers, PC importers and distributors, ISPs, graphic design shops designing web pages, etc.

The entity would need to gather and continuously update such data as the following:

- Classification of companies

- Employment figures showing the total workforce by job classification inside and outside the sector
- Products
- Services
- Technologies
- ICT education
- Densities and penetration rates of various products and services
- Other indicators will need to be established
- Number of graduates per ICT field per year of graduation
- Unemployment of ICT personnel
- Financial information
- Export and import figures for ICT products

One of the main benefits of a rigorous collection of such data is the monitoring of trends. Another would be the ability of Lebanon to publish its data with international organizations such as the ITU.

The survey would provide a baseline for:

- Total revenues of ICT companies
- Share in GNP
- Revenue due to export
- Share in the national export
- Share in the national import

The effort is needed because:

- Knowing the size of the sector and its contribution to the GDP will lead to a better evaluation of its national importance
- Analyzing the challenges and opportunities of the sector requires knowledge of its behavior and levels of expertise.
- Government policies that relate to communications, taxation, encouragement of investment and other issues, require a firm quantitative knowledge of the sector.
- Donor funding is a major input to the sector. It is therefore important to provide donors with accurate information about the sector.
- In order to better place Lebanon on the international map, it is important to have up to date and valid information about the sector.

On a regular basis, recommendations will be drafted based on the collected and analyzed information. The project will help the ICT sector disseminate the recommendations and findings and will provide the coordination necessary with the various agencies concerned (Commercial Register, Ministry of Economy and Trade, Chamber of Commerce, etc.).

3.9 Setup a Government Entity to Handle ICT Matters

Purpose: Lebanon needs to have its various ICT matters well coordinated. An entity should be setup to handle to plan, coordinate and monitor various aspects of the ICT sector and activities.

Description: Throughout the years, many models have been used for a national body concerned with ICT matters. Early in the 70s, the National Computer Center that took

care of all government purchasing was a popular model in the Arab world. It fell out of favor with the proliferation of ICT solutions. No suitable replacement model was found.

Today, Lebanon has no clearly recognizable entity to take care of ICT matters. OMSAR has become a de facto ICT expert because of its various initiatives and also due to the large ICT component in the 3 main funds it is handling. However, OMSAR does not have a clear mandate nor is one forthcoming.

It is important to state at the start that what is required is not a centralized ICT body that takes care of all ICT matters such as training, purchasing and implementation. This is not practical and in many countries, such models served to delay and encumber the activities of the ICT sector.

The solution proposes the set up of an ICT entity that operates within the government in a planning and monitoring role. The location of this entity would be determined in due course so that it will have a driving and decision making capacity.

The main purpose of this entity would be the following:

- To become a part and the main support of the Ministerial ICT Committee
- To be involved in the development and implementation of national ICT strategies such as the eStrategy, eGovernment, eCommerce and similar initiatives that will come up in the future.
- To assist the various public sector agencies in developing their ICT strategic plans
- To coordinate the results of such plans to ensure that global objectives are being met while at the same time eliminating duplication of resources and effort.
- To have the right workforce needed to support various public sector agencies in their implementation plans.
- To coordinate ICT training in terms of carrying out training requirements and monitoring implementation.
- To coordinate efforts with the private sector
- To coordinate efforts with professional ICT organizations
- To coordinate the effort of gathering ICT data
- To foster a conducive legal, institutional, and commercial environment for the ICT sector
- To attract local and international ICT investments
- To ensure citizens' access to information and communications infrastructure

In fact, many of the proposed solutions in the National eStrategy project need a planning, coordinating and monitoring body and the proposed entity would be the right body to do that.

3.10 Volunteering Services Network

Purpose: To promote and facilitate volunteering and expand the services provided by volunteers in Lebanon and to encourage active citizenship in which citizens feel they have both the opportunity and responsibility to improve their society through volunteering.

Description: The Association for Volunteer Services (AVS) was established in 1999 to promote, facilitate and improve volunteering and community service throughout Lebanon. This helps to address community needs as well as encourage citizens to make a positive difference in their society. AVS is a non-profit organization and has been

active organizing volunteer opportunity fairs for volunteer service organizations, producing an annual volunteer directory, carrying out youth service days and many other related activities.

One of the needs of AVS is to establish a network of volunteer services available to the citizen so that he or she can either contribute to these services or seek them. This can be achieved by supporting AVS in widening the scope of its existing website.

The scope can be widened to cover the following functions:

- Provide a detailed list of all voluntary organizations that actively seek new volunteers
- Provide a constantly updated listing of volunteer opportunities available in these organizations for both individuals and groups (School classes, scout groups, etc.)
- Provide the citizen with the means of responding online to such opportunities to serve as volunteers
- Provide the means to register individuals or organizations that are interested in being volunteers
- Provide an online channel for schools and youth groups to register, develop, and report their youth volunteer projects as part of AVS efforts to promote youth volunteering
- Provide a listing of research and semi-professional needs of non-profit organizations that can serve as research and internship opportunities for university students
- Link with international volunteer agencies
- Develop pages charting out each activity undertaken by AVS
- Link to sites that have material on volunteerism
- Provide online content of interest to volunteers

The above activities would also encourage the collaboration of government, NGOs, the private sector, and the media to promote and facilitate active citizen participation through volunteering.

It is important to note that, to achieve such objectives, the following is needed:

- Development of facilities throughout Lebanon that help organizations, educational institutions, and individuals to access and actively interact with this website (both to list volunteer opportunities and to find them) – these may be in Ministry of Social Affairs centers, public libraries, educational institutions and/or other publicly available venues.
- Development of the basic computer literacy of these organizations, educational institutions, and individuals so that they can participate in this project
- Training of existing staff and expansion of staff in these locations (Both paid staff and volunteers) to monitor these access points, and in some cases to be the liaison between the website and the computer illiterate individuals who would like to participate in these website services.
- Development of training materials, ideally online interactive training, for the participating organizations, educational institutions, and individuals to learn how to participate in these website services most effectively.
- Personal contact and public awareness campaigns to encourage participation by organizations, educational institutions, and individuals.

The main challenge is to secure the funding to make all of this possible.

3.11 Lebanon Business Promotion Entity

Purpose: Lebanon has a wide variety of services that it can offer. These are mostly in the areas of turn key projects and technical know-how. There is a need to establish an entity that can represent Lebanon by promoting such services and managing their execution.

Description: In the past, Lebanon was instrumental in the various renaissance periods that took place in the Gulf. As far back as the 50s, Doctors, Engineers and other professionals populated the Arab world transferring their know how. In the 60s and later on, and with the advent of the oil boom, the Gulf benefited a lot from Lebanese effort and knowledge.

During the current period, it is feared that with the whole world looking at Iraq and its reconstruction and doing it all through the Gulf Countries, Lebanon will be left behind.

This Solution proposes setting up a unit within the Government that is strongly partnered with the private sector. The unit will have the following objectives and will initially concentrate on ICT and related services:

- Ensure that Lebanon is well represented in all areas where business is being promoted. This relates to a separate Solution where a strategy is followed to promote Lebanon in most trade fairs and exhibitions.
- Ensure that the private sector is aware of all new projects that are coming out in the region.
- Assistance to the private sector in acquiring the relevant information.
- Simplifying the procedures for bidding on such projects through simplification of export facilities among others.
- Representing Lebanon as a consortium so that new projects can be bid through this entity and its private partners.
- Managing and monitoring the projects undertaken through its offices.

In many ways, this unit will have a similar mandate as that of OMSAR. The latter manages projects on behalf of the public sector. The new unit can manage projects on behalf and in partnership with the private sector.

3.12 Text to Audio - Arabic Talkster

Purpose: To develop a reader that converts Arabic text into voice. This would be useful as a reader to those who have reading challenges: illiteracy, blind or the aged.

Description: English has a large number of software applications that allow a reader to import text into the application whereupon the application would read the text aloud. Voice pitch, gender and speed can be selected.

The main benefit of such a software has been to allow those incapable of reading to access literature, training material or other reading matter. Such persons can be the illiterate, the blind, those that are physically handicapped and cannot hold books or access them, etc.

Arabic is not available for such readers. Developing such a reader would be an incentive to any innovative software developer. Two benefits would result: encouraging advanced

software development and providing this segment of the population with access to reading matter.

In another solution, it is proposed to setup Lebanese and Arabic literature in text form. Much like the English language based Gutenberg project, this would be an excellent source for the Arabic Talkster.

3.13 Survey Educational Software

Purpose: To identify educational software for use in Lebanon in its original language or for the purpose of translation into Arabic. Such software can be for formal and informal education (Including ICT).

Description: The West has already gone a long way towards the development of Computer Based Training (CBT) and the development of eLearning material. It is therefore not recommendable to repeat the exercise for material that is of use to Lebanon.

Such material covers the following educational areas:

- Formal education as a support to school and university curricula
- Informal education
- ICT training

This solution is an ongoing survey that aims at the identification of such products and the assessment of their suitability for Lebanon. The database to be developed for such a list will contain information about the material, its source, pricing and availability.

Once found suitable, other initiatives or solutions can benefit from such a database.

3.14 The Internet Hub Project

Purpose: To establish an Internet Hub in Lebanon.

Description: An Internet hub is a central distribution point on the Internet. Establishing an Internet hub in Lebanon means that Lebanon would become a major node on the Internet, a place that houses the equipment where Internet traffic is collected and distributed.

Arab Governments have not taken any initiatives for building an Internet gateway infrastructure for the region. Arab end users simply connect through European or USA IP destinations in order to connect to each other. The Gulf Cooperation Council (GCC) accomplished the linkage of the gateways of Kuwait, Qatar, Bahrain and the UAE to one global backbone through the Fiber Optic Gulf cable. Without this initiative, connecting a user in Kuwait to a web site hosted in Bahrain would have caused the communication to be routed through New York. In Lebanon, ISPs have taken the initiative to establish a common traffic exchange gateway. Without this initiative, the national IP traffic would also have been routed through Europe in order to reach its local destination.

In the absence of an Internet Hub in the region, launching one in Lebanon would provide it with a major opportunity to become the Internet capital of the Middle East. Inner-Arab

Internet connections can come together in Lebanon. Lebanon would also become the key starting point for the most important Internet traffic to New York and London.

The project needs to establish the following:

- Which equipment to use?
- How much bandwidth to secure?
- How to ensure the availability of international telecommunications lines to Arab countries
- Which Internet node(s) to connect to?
- How to connect to the Internet node?

In addition to the physical aspect of the problem, the project would entail managing and marketing the Internet hub. Data services should be provided as well as hosting, security, and other services. The structure needed to operate and maintain the hub must also be considered.

3.15 The Citizen's Guide to Health Information and Services

Purpose: This network would improve the access of the citizen to information about health issues and health services providers.

Description: Access to information about health issues and health services providers is limited. This is particularly true in rural areas and for the poorer population. Access points can provide this type of information. Once spread across the country, the information would be of extreme benefit to a large proportion of the population. Already, there is a service called Toubib Online which presents some of the information required by this Solution ([Click Here](#) to visit their site).

The access points can be located in municipalities, Community Telecenters, health centers and clinics, Ministry of Public Health offices, libraries, schools and others. Of major benefit would be the presence of a guide who can assist users in navigating through of the information.

The system would be setup to work on a touch screen system to facilitate the use for computer illiterates.

Information about health services could cover:

- Health centers
- Hospitals and Clinics
- Doctors
- Pharmacies
- Laboratories
- Special programs launched by the Ministry of Public Health such as those on diabetes, osteoporosis, etc.
- Online medical services such as physiotherapy, chiropractics, etc.
- Red cross centers
- Medical equipment for hospitals, doctors and patients
- Beauty care and cosmetics
- Emergency services
- Drug rehabilitation centers
- Online medical services

The information can be presented in a regional classification. Terms and conditions can also be setup to provide additional assistance.

The system would collect information about user trends, access point usage, information type request, etc., in order to provide users with the best service and information focus.

Included in this portal would be a variety of general medical information that would provide the citizen with information on:

- Various common diseases
- Symptoms to watch out for
- General health good practices
- General medical information and education
- Drug information and awareness
- Good practices for the use of pharmaceutical products

The challenge of this solution is to keep it up to date as well as to promote its use.

3.16 What's On in Lebanon

Purpose: To concentrate all current information about Lebanon in one portal.

Description: The main purpose of this solution is to setup a site that consolidates all the information of use in a citizen's day to day life. Many attempts have been made to group such information in one site. However, such attempts suffer from the following:

- The information is not easily accessible
- It is unreliable, incomplete and not kept up to date
- There is a lot of duplication of information
- Much of the information that is really needed is not setup on the web

The above reasons present a strong case to consolidate all the information in one web site. The benefit will first be to the Lebanese citizen. However, considering Lebanon's dependence on the tourism sector, such information would also be very useful to visitors intending to visit Lebanon or those already on a visit and who require assistance and guidance.

The site will have a central access and will be called something obvious such as "What's On in Lebanon". The site can contain such information as the following:

Leisure

TV shows
Cinemas
Cinema Clubs
Theaters
Festivals
Lectures
Conferences
Book signings
Obituaries
Music events

Sports and Sports Facilities

- Local events and results
- Regional events and results
- International events and results
- Special events (Wimbeldon, World Cup, etc)
- Beach clubs
- Sports Clubs
- Facilities for the disabled
- Fitness Centers

Catering / Food / Beverage

- Hotel facilities
- Night clubs
- Restaurants and their menus
- Pubs and bars
- Discotheques

Commercial Info

- Airline offices (Reservations and sales)
- Airport movements
- Banks
- Bookstores
- Car dealers
- Car rentals
- Exhibitions (Beirut Hall, Forum, etc)
- Home appliances
- Photographers
- Port movements
- Real estate dealers
- Recruitment and Job hunting (From both side: companies and employees)
- Shopping malls
- Stores on sale
- Tour agents
- Travel agents
- Video Shops

Lebanon General Information

- Magazines
- Newspapers
- Periodicals
- Public and university libraries
- Road Maps
- Touristic sites
- Traffic information
- Typical Road routes (How to get to Afqa, how to get to Beiteddine, etc)
- Walking sites
- Weather data / photos

Institutional Information

- Chamber of Commerce
- Local police
- Ministries
- Municipalities

National lottery results
National results: Bacc, Brevet, etc
Schools/Universities

Emergency Services

Doctors
Fire station contacts
Hospital contacts and locations
House problems (Water, electricity, etc)
Police contacts
Road alerts

Classified Information

Items for sale (By category: cars, home appliances, etc)
Items wanted (By category, etc)
Lost and found by category
 Children / Maids / Passports / Keys
Obituaries
Special services

International Information

Foreign Exchange
Stock Exchange (Beirut stock exchange)
Daily news summary (Headlines from main Beirut Newspapers)

Links to Other Sites

Radio and TV sites
The press
Ministries and Agencies
Various sites proposed as separate solutions

The list is endless.

Income for the site can be generated from the following main sources:

- Advertising on the pages
- Additional exposure for specific companies. (For example, for restaurants who require to have their menus scanned and posted on the website).
- Classified advertising should be free of charge. However, those that post additional can be charged.

Since much of the above is available in one form or the other, the challenge of this solution is to provide the necessary cover to consolidate all such information.

3.17 Setup Information Decision Support Center

Purpose: to provide valid and robust information for use in decision making by key central authorities.

Description: Data and information in Lebanon are fraught with problems such as unavailability, unreliability and multiplicity. This frequently stands in the way of proper decision making. Following the model of the IDSC in Egypt which has been extremely successful, the proposal is for the setup of an entity with the name "Information Decision

Support Center". The IDSC would have as its main purpose the analysis of data and information required by such agencies as the Presidency, the Cabinet, the Parliament, various Ministries and Agencies and others.

The information can be in the following forms:

- Regular data to be disseminated to key recipients.
- Specific studies carried out to resolve and clarify problematic issues.
- Ongoing collection of useful information, indicators and other data.
- Information to international agencies who publish country data in various sectors such as the World Bank, the ITU, etc.

The media for dissemination can vary from printed matter, to CDs and special purpose web sites.

The center would consist of staff covering ICT, statistics and experts in various socio-economic issues.

3.18 Implement ICT Standards and Guidelines

Purpose: to standardize various ICT products and practices within the Government. It is hoped that the private sector would also benefit from such standards.

Description: OMSAR has launched a key project called "ICT Standards and Guidelines". The project's aim was to develop Standards and Guidelines in 13 key areas grouped under products and practices.

The currently developed ICT Standards and Guidelines cover the following areas:

ICT Product Oriented Standards

- Hardware
- Networking
- Telecommunications
- Databases
- Operating Systems
- Building, Rooms, & Environment

ICT Practices Oriented Standards

- Quality Management
- Software Applications
- Package Evaluation Methodologies
- Information Integrity/Security
- Data Definition and Exchange
- Risk Management
- Configuration Management

The project covered the first phase of standardization, namely the development and definition of such standards.

This Solution proposes the completion of the implementation phases so that Standards and Guidelines can be setup under a proper legal framework. They can then be disseminated and introduced within ICT Units in the public sector. This would require training, monitoring and evaluation. It would also require control in case the standards are mandatory.

Such an effort requires an entity that would be setup specifically for that purpose. Where that entity would be placed can be discussed in due course. Suggestions could be LIBNOR and OMSAR.

3.19 Arabic, English and French Glossary

Purpose: To standardize key terms in the three languages for such domains as management, technology and other sciences.

Description: One of the problems facing any content developer is that of providing text in more than one language. Although translation facilities are quite available in Lebanon, first of all they have not been exposed on the web. Secondly, they have not been standardized. Very often, key words such as "traceability", "backup", "computer" stump the translator. The result is miscommunication.

The range of words or terms to be used can cover the following sectors:

- Technology
- Management and organization
- Economics
- Business and trade
- Insurance
- Government legal and regulatory terms
- Legal terms
- Accounting
- Etc

Much of the above are already available but are found in disjointed sources. Setting them up in one consolidated database would be of major benefit.

The project is to be implemented via a web site that is generally partitioned into 3 areas:

- One area is used to collect the terms to be translated. Such terms are put into the "pending" state.
- Another area displays the pending terms and allows visitors to suggest translations.
- The third area displays the terms that have been agreed upon by an appointed technical group and have the status of "finalized".

The project can be implemented in four ongoing stages:

Stage 1: Setup the web site. This would contain the above 3 areas.

Stage 2: Use the first area to collect the terms to be translated and place them in the "pending" status. Various parties can suggest terms online. Suggestions can be in any of the 3 languages.

This area of the site can also be supplemented by direct entry of lists of terms to be translated. The lists may come from various books, glossaries, etc. The entry can be directly into a database or can be in a back office, using the same web pages.

A technical group can review the suggestions and select those to keep, remove duplications, etc.

Stage 3: The site will provide a temporary work area where terms to be translated are made available. Visitors can then suggest translations. In this manner, the effort is shared over a wider audience.

Stage 4: The technical group can then review all suggestions and agree on the most suitable. As and when each term is finalized, its status can be changed from “pending” to “finalized”. It can thus be displayed in the pages that show the standardized translations.

This web based application can also be disseminated on CDs for offline browsing.

3.20 The Citizen’s Guide to Legal Issues

Purpose: To provide the citizen with assistance in getting familiarized with legal issues of interest to his or her daily activities.

Description: The citizen often falls into trouble necessitating the use of legal services that are complex and unclear. Prevention and avoidance are basic requirements. The citizen needs to know his or her obligations and rights. The educational culture in Lebanon does not provide such a venue for the citizen or for the private sector. However, the latter are often supported by legal counsel reducing their risks.

An entity needs to be setup to develop and maintain a web site that provides such legal information and guidance. In some cases below, the issues are complicated by the need to provide information that relates to specific religious considerations. There are often differences between government laws and religious laws.

The following guidance is required:

- Wills and inheritance issues
- Marriage, divorce and separation
- Inheritance laws
- Real estate laws and regulations: sales and purchases, surveying, restrictions, taxation, etc.
- Rental laws and regulations
- Insurance related laws and practices
- Consumer protection laws and regulations
- The legal system in Lebanon
- Key legal institutions
- Company law: this relates to two other Solutions, one on Business Startup and the other on Labor Relationships

It is important to mention that this site will not replace formal legal practice. It is meant to guide the citizen in his or her daily life. The site can also be a means to direct the citizen towards the right counseling in case of informal legal requirements.

3.21 The Citizen's Guide to Governmental Procedures

Purpose: to setup procedures on the web that can direct and guide the citizen in all his or her interactions with the Government.

Description: this project has already been launched and executed by OMSAR. It can be found at the following web site: www.informs.gov.lb. This site presents a variety of procedures classified by Ministry or Agency. The site is already mature. This solution proposes extending the functions of the site in the following manner:

- To legalize all procedures and present them in a manner that proves they have been endorsed by their related Ministry or Agency. This would make them valid for use with the public sector staff.
- To expand the content to include all procedures.
- To monitor the procedures and setup a mechanism that updates them on a regular basis.
- To develop a page that allows citizens to query procedures and report incidents which are discrepant with the published steps and conditions. This becomes a combination virtual help desk and complaint center.
- Develop the whole web site in a downloadable form which can be used off line on PCs not connected to the web
- Separate those procedures that relate to expatriates living in Lebanon or about to visit it and publish them in English and French.
- Distribute the database to various centers such as embassies, airport, etc.

The benefits are already being reaped in terms of transparency, speeding up of work and reduction of the effort needed by the citizen to complete his or her requirements.

3.22 Develop Public ICT Literacy Syllabus and Benchmarks

Purpose: Establish standards as to the minimum level of literacy recommended for different types of users in order to incorporate such standards in curriculums, job descriptions, etc.

Description: An ICT curriculum for school students has been developed but has not yet been put into practice. In light of this effort it is important that other members of the society adopt a minimal standard of ICT knowledge.

The standard would start by identify different segments of society: executives, secretaries/assistants, university students, etc. Standards can then be defined for each segment. These standards would represent the minimum ICT literacy level for that segment of society.

Different requirements would be recommended in different ways. A standard for university students would be adopted as part of the university curriculum. That for private companies could be published as a guideline. Individual societies such as the industries, the insurance group, the Association for Banks in Lebanon would then implement their literacy programs according to such guidelines. Training companies can then contribute and benefit by providing matching courses.

3.23 Develop Strategic ICT Planning for Each Ministry and Agency

Purpose: To develop strategic plans for ICT in each Ministry and Agency.

Description: Reviewing a survey conducted by OMSAR of the software applications found in the public sector, it can easily be seen that very few public sectors have strategic applications that offer integrated comprehensive automation of their core functions. Most of the applications are stand alone applications covering specific needs.

This follows from the fact that very few public sector agency have actually conducted strategic ICS plans that identify their requirements and plan their automation paths. More importantly, such plans would also indicate how a Ministry or Agency would interact with citizens, other public sector agencies and the public sector.

This solution proposes a stage wise plan that prepare a Strategic ICT Plan (SIP) for each Ministry and Agency. The plan would analyze the following:

- The short and a long term needs of the agency
- The requirements of the citizen and how these can be subsumed under eGovernment initiatives
- The interaction with other agencies
- The interaction with the private sector both local and international

On completion of such an analysis, this is then converted into a functional or conceptual design. Such a design would be submitted to the users and the stakeholders of the agency for review. Once approved, this design becomes the basis of further inquiries in the SIT. Such issues can now be resolved:

- What is the current inventory of ICT resources?
- What are the additional ICT resources needed to meet the above requirements?
- What are the priorities of implementation of the various systems and applications?
- A proposed schedule for the whole effort phased into the above priorities
- An estimated budget for the whole effort based on the above schedule
- Presentation of the proposed technical solutions

Strategic ICT Planning results in an overall view which can be had by the Government which would result in the following:

- Standardization of applications
- Avoidance of duplication as similar applications are needed in different agencies (Materials control, attendance, accounting, document tracking, etc.).
- Bulk purchasing to meet the required ICT resources
- Resolution of interfacing problems at an early stage

More importantly, a concerted effort to develop such plans would also require proper coordination so that an overall strategies can be streamlined covering such areas as interfaces, data exchange, duplication and training and licensing cost reductions.

If resources are not available for a global analysis, the Solution can group the Ministries and Agencies into top, medium and low priority agencies starting with the top priority group.

3.24 Trade Information Center

Purpose: To set up a web based Trade Information Center that provides Lebanese and international players with the information needed to improve and modernize the Trade sector in Lebanon.

Description: A Trade Information Center (TIC) was established in the Lebanese Ministry of Economy and Trade (MOET). The unit's startup was funded by UNDP and the Government of Lebanon. This Solution builds on the existing effort. It is also linked to the Solution proposing the setup of various Trade Points.

Trade is a key sector in the Lebanese economy. Lebanon's trade has to increasingly compete with that of other Middle East and Mediterranean economies. With the advent of the Internet and eCommerce, the trade sector has to compete with an international community as well.

Lebanon has begun to adjust to changes in trade in the region as well as the world economy, including:

- Increasing globalization of commerce
- The internet and eCommerce
- Advent of eGovernment
- Entry into the World Trade Organization (WTO)
- Rapid development of technology
- Emergence of new industries
- Stricter imposition of transparency

The impact of these and other changes is being felt most severely by small and medium-sized enterprises (SMEs). The increasingly high cost of doing business in Lebanon has deterred new entrants, especially SMEs that are ill-equipped to work through formal contacts. The problem is exacerbated by the overwhelming majority of firms in the Lebanese economy being SMEs, according to a wide range of definitions of size.

To help address problems in the international trade system in general and those of SMEs in particular, the Trade Efficiency Initiative (TEI) was launched in 1992 by the United Nations Conference on Trade and Development (UNCTAD). The methodology of the present Solution is based on that of the TEI. It should be applied in detail in the Lebanese context to a set up an online Trade Information System and Trade Points.

The purpose of the TIC will be to set up and maintain a mechanism whereby information on trade and related topics is gathered, elaborated, and made available to the public and private sectors in Lebanon and abroad.

The TIC will promote the flow of business information and provide equal access to it to both the local and foreign business communities by:

- Encouraging businesses to explore the appropriate scope for internationalization of their activity
- Facilitating circulation of and access to economic and business information (particular consideration should be given to SMEs and newcomers to international trade)
- Improving training capacities for more effective use of business information by the public sector, business associations, and individual firms

- Supporting the use of internationally accepted standards, formats, and coding systems used in the dissemination of information
- Ensuring that the TIC in Lebanon centralizes and makes available for retrieval all relevant information on Lebanese trade regulations product-by-product, using standard formats
- Ensuring the availability and reliability of up-to-date trade statistics
- Using web based technologies in the collection and dissemination of statistics
- Encouraging government departments that generate economic information to meet the needs of the national and international business communities.

The following information can be included:

- Export policies, procedures and regulations, export licensing, export quotas, prohibited exports, export tariffs, export payment arrangements, related fiscal charges on exports, export procedures and documentation, export finance, and export promotion zones
- Import policies, procedures and regulations; information on prohibited imports; import tariff classification; import tariffs and taxes; import licensing; import quotas; customs valuation, duties, and clearance; special customs zones; pre-shipment inspection; special import requirements; environmental regulations; basis of duty assessment; entry rules and procedures; transit and re-export; antidumping regulations; required import documents; packing, marking, labeling, sanitary and safety rules; trade related intellectual property rights
- Trade and other foreign economic agreements, including bilateral, subregional, regional, multilateral, and commodity trade agreements; bilateral trade issues and foreign aid and grants.
- Foreign exchange regime, including currency convertibility and exchange regulations
- Market information and statistics, including balance of trade, details of exported and imported products, and direction of trade by product
- Economic data including national income accounts, sectoral origin of GDP, balance of payments, inflation data, price information by product category, short-term price factors, price discounts/premiums, wholesale/retail prices, local distribution costs, fob/cif prices and freight rates.
- Basic country data, including population, religions, languages, climate, information on the capital and other main trading centers, trade fairs, public holidays, working hours, time changes, weights and measures, electric current, visa requirements, communications, fiscal year, government, political conditions bearing on trade, regional and international affiliations, business etiquette and main hotels
- Transport and storage, including ports, sea, air, road and rail transport and warehousing and transit facilities.

The main challenge to this solution is to keep the information up to date and to ensure its wide spread dissemination.

3.25 Trade Point for Lebanon

Purpose: To set up a Trade Point web site for Lebanon whose purpose is to consolidate the location and operation of various steps in the trading process. This will ensure timeliness and the receipt and dissemination of correct information, thus enhancing efficiency for import and export operations.

Description: Trade Points have been accepted as an efficient means of promoting trade. These will be a logical and practical extension of the Solution that proposes a Trade Information System.

Trade Points will act as both the focal point of trade information activities and a one stop window for the provision of services to traders.

Establishment of the TP and its provision with basic operational tools has effectively already started through the activities of the TIC at the MOET. The present TIC focuses on trade facilitation but is not highly technology intensive.

Trade Points should combine the following elements:

- A center for facilitating trade, where services and advice are given by participants in foreign trade transactions (e.g. Customs, chambers of commerce, freight forwarders, transport companies, banks, insurance firms, etc.) These participants will be linked via a network with their own institutes to facilitate any on the spot transactions.
- Access to the Trade Information Center and assistance and guidance in its use. (See the separate Solution for the TIC).
- A global gateway connecting Trade Points to a worldwide network to facilitate access to additional information and transactional capabilities.

The Solution will show how information should be exchanged with other TPs, related trading parties and customers and what formats and standards should be used. This will involve the above recommendations on how trade related information should be formatted and structured for exchange.

The legal and regulatory aspects of adopting electronic measures for trade will be reviewed as a first step. Development of the TP will then go through the following stages:

Stage 1: Development of trading processes reengineered to be suitable for setup on the web. This requires coordination between various parties such as banks, public sector agencies and customs.

State 2: Revision of the required legal procedures to ensure the proper implementation of the trading process.

Stage 3: Development of the proper exchange mechanisms needed to authenticate records, acquire and/or enter data and setup the proper applications for trading transactions.

Stage 4: Implementation of the Trade Point through a pilot project that is tried and tested to arrive at a fully working Trade Point.

Stage 5: Launch of the Trade Point to provide traders with the required web based processes. This requires training, awareness campaigns and support.

Stage 6: In this more advanced phase of TP development, local connections should be set up from the Lebanese TP to other Trade Points in the world.

It can be seen that the Trade Point Solution is strongly linked with that of the Trade Information Center.

3.26 Setup Business Startup Advisor

Purpose: To facilitate the setup of businesses easily, efficiently and with transparency, without the added expense of involving professional services. The project would also provide continuous information and learning opportunities about issues concerning businesses in Lebanon.

Description: Starting up a new company in Lebanon has never been an easy task. Alternatives are available which are not commonly known. Different types of companies need different documents, authorizations and procedures. Both counsel and information is required to ease the task of citizens. Furthermore, such an effort should be opened up to international companies wishing to setup operations in Lebanon.

The kind of assistance would cover legal registration issues, relationships between employees and employer, relationships with the Ministry of Labor, the National Fund for Social Security, accounting and Ministry of Finance requirements, taxation, etc.

The Solution covers the following steps:

Step 1: Identify all types of companies that can be registered in Lebanon, starting from specialized services such as catering, shops and cosmetics and going through more commercial services such as trading and industry.

Step 2: All information and requirements for such companies would be identified and clearly documented. Forms would be prepared for downloading. Special addresses would be given in case there are visits to be made when collecting the proper authorizations or documents.

Step 3: A web site would be developed which would guide the visitor to the type of company that he or she needs to setup. Decision criteria would be identified allowing the visitor to select the most suitable format for the company. The site would also provide small businesses mostly with updates about legal, accounting, labor relationships, insurance, social security and other issues that they need to be aware of.

Some sections could cover new and interesting trends regarding businesses and efficiency of work among others. Training on specific subjects would also be made available in order to encourage continuous improvement in skills.

The site could be setup and maintained by the private sector in order to insure more up-to-date supply of innovative information and trends about business. This would be done in cooperation with the government sector in order to maintain the links with all the setup, legal and accounting requirements.

Step 4: An advisory group would be setup to assist citizens whenever the site information is not sufficient.

One of the main benefits of this solution would be to promote the startup of companies by women who have traditionally shied away from such an initiative because of its complexity and its male domination.

3.27 Provide Comprehensive Electoral Information Online

Purpose: Increase the transparency of the election process, assist the informed voting process for citizens, and encourage candidates for election to run their campaigns based on experience and future vision and plans.

Description: The current election process is mostly based on word of mouth about certain candidates, their high profiles, and their association with certain groups in the country. Very few citizens know the previous records and future plans of candidates when it is time for elections.

The scope would initially cover parliamentary and municipal elections. It can later be expanded to cover other election processes.

A web portal would be developed to reflect both the past experience and future plans of each of the candidates. The website would show no preferential treatment as it would follow a certain standard as for the type of information and format of the content. The candidates themselves would provide the content according to specific formats provided by the group that would run the web site.

The site would also inform the citizen about the laws and regulations related to the particular election under consideration.

3.28 Publish Terms of Tenders and Bids

Purpose: To publish details of all tenders and bids issued in Lebanon in one centralized place thus providing opportunity for the private sector to a wider set of projects. Furthermore, there is a need to publicize international tenders that Lebanese companies can bid for.

Description: One of the major problems faced by the private sector is knowledge for projects that are being tendered for either by the Government or by other companies in the private sector. Currently, there is no centralized location for accessing this type of information. The main reason is that there is no entity to gather the data. Setting it up on a database and publishing it on a web site are simple matters. It may therefore be beneficial to include this solution as part of the Trade Information Center in the Ministry of Economy and Trade.

The main purpose would be to collect information about all the terms and conditions for all tenders and bids issued by both the private and the public sector. Suitable classification can provide visitors of the site with quick access to their requirements. Free newsletters can be sent by the system to subscribers that select keywords of interest to them thus obviating the need to constantly search for projects.

Furthermore, there are many international tenders and bids that may be of interest to the Lebanese private sector. These are more difficult to collect but are equally important as the local projects.

3.29 Reform ICT Labor Laws

Purpose: The purpose of the project is to recommend a draft bill for a new collective labor contract for the ICT sector.

Description: The ICT workforce is vulnerable to a brain drain, mostly to the Gulf Countries but a fair proportion going (Or staying in the west). Its situation in Lebanon is not encouraging. Most ICT staff have unfair contracts and may not be registered under the National Social Security Fund. Salaries are unbalanced and working conditions are not conducive to proper production. Training is minimal and is often undertaken by the individual on his or her own.

The nature of ICT work is different from that in other sectors. It requires varying types of shifts. It can be performed at the office or from home. It requires ongoing training to cope with new technologies. It has a constantly changing job classification. The structure and responsibilities of an ICT Unit vary and are constantly revised to suit new technologies. The ICT workforce has immediate access to vital information of the business.

The ICT workforce in Lebanon is a young workforce with specific needs for health and other social insurance. It needs to address all the above issues including those of health, insurance and fair contracts.

In Lebanon, the employees of the banking sector and employees of some large companies benefit from a collective labor contract based on the Labor Law but addressing specific needs of its employees.

The ICT workforce can benefit from a collective labor contract. Such a contract will spread homogeneity across the workforce. Many employers are losing ICT employees because of poorly phrased contracts (Or none at all). Many employers need ICT employees but do not understand ICT. Such a uniform contract will guide employers of and help stabilize the rapid turn over in their companies.

The challenge to this solution is to have a robust job classification structure for ICT staff.

3.30 Digital Cultural Heritage Protection/Diffusion (Vmuseum)

Purpose: To digitize the cultural heritage of Lebanon in order to disseminate it more efficiently and protect it.

Description: This solution aims at the following general objectives:

- To cover each one of the following arts: Poetry, Fiction, Music, Painting, Sculpture, Dance, Theater and Cinema.
- To develop an electronic document that presents the work of key artists in each of the 8 Arts starting with the 20th Century.
- To prepare the document for distribution on CD-ROM's
- To prepare the same material on the CD, possibly more extensive, for hosting on a Web Site.

For all the 8 arts, the following features are common:

The major Artists of the 20th Century for each Art will be identified. The identification is based on the Artist producing his major works in the 20th Century irrespective of when he or she was born.

For each Artist, the following content will be developed:

- A list of the major works
- A biography of the Artist with appropriate photos
- A list of awards and prizes
- A list (Or bibliography) of his or her works
- A bibliography of books or articles about the Artist
- A selection of articles that best describe or analyze his or her work
- Links to internet sites that are concerned with the Artist or with related issues such as movements, schools, events, etc.

It is assumed that in most of the arts, there will be issues related to the legal use of the intellectual properties. However, initial talks with some poets and artists showed that this will not be a major issue as most of them recognize the importance of being included on the CD/Web site and would hence welcome the project by waiving their copyright.

UNESCO has already embarked on a similar project. However, a much wider scope is required. This project can suitably be hosted by the National Archives Agency.

3.31 Guide and Search Engine for Lebanese Web Sites

Purpose: to make available to the public an index of all sites with relevant Lebanese content and to setup a Lebanese search engine.

Description: this effort is partially answered by several guides published in the market. The shortcomings of these guides are the following. First of all, they do not cover all sites restricting themselves to those with an interest in advertising. Secondly, the sites covered are mostly those with an .lb domain. It is known that a fair number of Lebanese sites are hosted under non .lb domains. Thirdly, these guides do not include sites that are about Lebanon but not published by Lebanese entities. Finally, the guides themselves are only available in printed form and not available on the web.

The above can be corrected by establishing an entity which can be placed within the private sector but supported by the Government. Its purpose would be to continuously research the web, collect the information and classify the sites according to a suitable indexing scheme. A special site can be setup to host such information. The entity would need to promote the site to ensure widest access.

Furthermore, the entity can acquire an industry standard search engine and index all such sites in order to provide visitors with fast and relevant searches.

The benefits would be essentially to allow the citizen to have access to suitable content on the web about Lebanon. More importantly, this site would be of use to international web visitors who need information about Lebanon.

3.32 Launch Web Based Tax Filing Forms

Purpose: To ease the task of entry of tax forms throughout the country.

Description: The Ministry of Finance is very concerned about the state of tax collection in the country. In the past, this was encumbered by complexity. This resulted in various unsound practices that the Ministry shunned. A project conducted by the Ministry in 1997 reengineered the process of tax filing by private companies. Its main approach was to simplify the tax entry forms. Secondly, the payments were made through banks. This resulted in an increase in transparency. This was due to companies feeling more relaxed that their tax forms are clear and are not going to be subject to interpretation, hence fines. During the first year of operation, the Ministry's collections increased by 38% translated into a sum of \$75 Million. Later years resulted in further increases.

The Solution proposes extending this process in the following manner. A web site would be developed with the following functions:

- Facilities will be provided for tax filing by all types of companies: professionals, limited liability companies, etc.
- Detailed instructions will be presented on the site for each type of tax filing.
- Companies and professionals will be given their IDs and passwords by the Ministry and can use the site to submit their tax applications.
- In due course, and when such payments are made available by banks, companies can settle their taxes through direct payments.

The main benefits follow from those identified above: speed, accuracy, transparency and flexibility. Furthermore, this would result in a reduced load on the Ministry.

3.33 ICT Donations Clearing House

Purpose: To setup an entity that coordinates ICT donations throughout Lebanon. Such resources can then be re-channeled to schools and to the rural areas.

Description: Information and Communications Technologies change very quickly, often resulting in obsolete equipment and software within 2 to 3 years of their introduction.

For example, using Windows 95 today is seen as a backward step. However, much learning was achieved by using Windows 95 software applications when that operating system was state of the art. The learning process and content have not become obsolete. Therefore, there is no reason why such equipment and software cannot be exploited.

Furthermore, there is an ongoing drive to donate new equipment and ICT resources. Such a drive is uncoordinated and results in duplicated effort.

There are two major segments that are challenged and that can easily use such equipment and software for various purposes: education, work and leisure. These are the schools in Lebanon and various rural areas outside Beirut.

The solution aims at setting up an entity that can collect such equipment and software and organize the effort needed to channel it to those that would need it.

The solution would go through several stages:

Step 1: Setup the necessary mechanism to promote the effort of collecting second hand resources and donations through web sites, mailers and advertising. A campaign for collection could be setup with the help of media and the solicitation of select businesses, such as Banks and others. The source of the ICT resources would mostly be companies and individuals in Lebanon wishing to dispose of their ICT resources or donate new resources or even contribute by funding. Such resources can also be acquired internationally from developed countries.

Step 2: Setup a small ICT unit that can evaluate the equipment and software and classify its usability. If need be, limited maintenance or upgrades can also be introduced to prepare the units for use. There are low cost software products that can be used on such equipment that mimic major office suites. UNESCO is already distributing one.

Step 3: Setup the necessary mechanism to identify needy sources and proceed with distributing the ICT resources accordingly.

The challenge in this project would mostly be the logistical arrangements that should be undertaken in order to facilitate the movement and preparation for use of these computers.

3.34 The Citizen's Guide to Skilled and Craft Services on the Web

Purpose: To provide information covering services and skills and provide these businesses with new ways of promoting their services.

Description: Lebanon has a large work force consisting of carpenters, plumbers, electricians, air conditioning technicians, etc. This work force operates in an informal manner and does not have any scheme for promoting its services except by personal contacts and word of mouth. The result is an ad hoc business environment that is detrimental for both suppliers and customers.

This project aims to develop an online guide for these services. Such a guide can also be disseminated in print form grouped by area or by skill. Following standard yellow page practice, the setup of an entry would be provided at no cost. However, parties wishing to have a more prominent exposure can opt to pay for such a service.

Access would be by a suitable classification of skills, geographical areas, etc. This would provide the citizen with an efficient and effective access to this data.

The challenge of this service is that Lebanon still relies on personal contacts. Citizens do not acquire services from parties they do not know. However, Lebanon is known for quickly following suit when a scheme is found of benefit. It is expected that the success of a pilot project in a small area that is promoted by the media and encouraged by the Government would lead to a nation wide acceptance of the system.

3.35 The Citizen's Guide to Consumer Protection

Purpose: To provide consumers with the information needed to protect their rights and with counsel on how to handle incidents or report transgression.

Description: Consumers are made up of a variety of groups:

- Lebanese citizens
- Private sector companies
- Tourists

These consumers have specific rights while acquiring products and services in Lebanon.

At the moment, there is a unit in the Ministry of Economy and Trade that governs issues related to Consumer Protection. This Solution proposes expanding the role of this unit to exploit ICT in its work.

The pre-requisites for this Solution fall under a general requirement and that is the extension of the current laws and regulations to cover:

- Wider areas of protection to cover organizations outside regular consumer goods such as with schools, airlines, transportation, banks, tourism services, etc.
- Web based acquisitions and behavior
- Company to company protection
- Bad practices that may harm the consumer without being outside the law
- False or misleading advertising
- Campaigns that mislead consumers such as the common practice of announcing on the phone that a person has won a ticket, etc.

The main purpose of this Solution is to launch an online Consumer Protection Guide. This Guide will develop and present the following:

- Consumer protection laws and regulations. These need to be presented in a manner that is simple for the consumer to understand, interpret and apply. Consumers need to have clear unambiguous statements of their rights. Furthermore, this page would include steps to be completed by the consumer when reporting incidents or behavior that falls foul of the above laws and regulations.
- An interactive page that allows consumers to report incidents, behavior or general transgressions.
- To increase transparency, companies that have been indicted by the Ministry of Economy and Trade would be listed on a special "delinquency" page.
- A page guiding consumers on how they can protect themselves against various types of fraud, mishandling, etc.
- A page guiding consumers on how to complain about various issues to the vendor, the Ministry, etc.
- Links to international consumer protection sites. This would increase consumer awareness of their rights and probably lead to further lobbying for additional protection.

The main challenge of this Solution is a cultural one. It needs to be presented in a manner that allows fair practice on both sides of the protection boundary.

3.36 The Citizen's Guide to Road and Transportation Information

Purpose: To provide the citizen with a comprehensive guide as to the various practices of transportation, the state of the roads and related issues.

Description: The state of transportation today in Lebanon is near critical. Despite major efforts by the Ministry of Transport, the Ministry of Interior, Municipalities and other agencies indirectly involved, it suffers from the following:

- A large number of vehicles on the road
- A large proportion of vehicles that are neither mechanically suitable nor are equipped with the right safety measures.
- A lack of proper traffic signs and signals and a regular misuse of them
- A basic disregard of traffic rules and regulations mostly due to lack of awareness of these laws as well as an inefficient enforcement of the same
- The state of roads that is liable to cause damages to vehicles as well as be a safety hazard
- An inefficient insurance scheme that does not properly cover the citizen
- Irregular public transport

Of course, the solution to the above is not in the realm of ICT. However, ICT can be used to create the necessary awareness and respect for such laws. Furthermore, ICT can be a basis for providing citizens with much related and useful information otherwise not easily accessible.

This Solution proposes the setup of an entity that maintains a web site which has the aim of guiding the citizen in all matters related to transportation:

- The laws and regulations governing such issues as vehicle registration, sale and purchase of vehicles, driving licenses, traffic laws and the use of the road system.
- Insurance rules and regulations
- Awareness campaigns related to specific issues such as laws regarding seat belt usage, fire extinguishers, use of mobiles while driving, etc.
- Good driving practices
- Good practices related to driving and the environment: littering, emission control, car graveyards, etc.
- Good vehicle maintenance practices
- Road and weather conditions
- Public transport schedules, locations and pricing
- Related services such as garages, insurance, car rentals, etc.
- Announcements of car pools that would reduce the expenses of a citizen reducing traffic at the same time.
- Classified ad section for the sale and purchase of second hand vehicles
- Etc.

The above can be complemented by an ongoing media campaign highlighting the main issues on the related web.

A final and major recommendation would be to merge the information on driving licenses with the Smartcard proposed by the Ministry of Interior. This reduces the need to carry several IDs.

The entity and the web site can be sponsored by such private sector parties as vehicle traders, insurance companies and major public transport firms.

3.37 National Awards for Excellence in ICT

Purpose: To provide incentives and rewards for Lebanese companies to excel in ICT.

Description: In summer 2003, the PCA launched the Golden Chip Award for software excellence and innovation. Similar awards would improve the ICT sector. Such awards would be established through a relevant ministry, possibly the suggested central ICT entity. The award would focus on the achievements of Lebanese firms in the area of information and communication technology. Similar awards for other business areas have become standard status measures in the west such as the Malcolm Baldrige National Quality Award. The advertising sector has long used this approach with success. It has led to improved performance.

Criteria would be established for companies to be included in the yearly contest. A number of criteria would be developed and a committee would evaluate the potential awardees based on such aspects as the following:

- Level of research and development
- Innovation
- Service delivery
- Impact of ICT solutions
- Exportability

This yearly event would be high profile and could possibly carry different categories of excellence.

The project has a dual impact. It provides moral and professional support to the innovators. Secondly, the visibility of such an event will promote ICT and government support of ICT.

On the financial side, the award may help the creator finance the innovation and/or patent and market it.

This solution can be linked to that recommending the establishment of ICT Research Centers.

3.38 Sports and Recreational Network

Purpose: To promote sports and recreation in Lebanon.

Description: Sports has always been a strong issue in Lebanon. However, due to the various polemics within and between the various federations, sports have lagged behind as a national culture. There is a directorate for youth and sports. It is carrying out interesting initiatives. However, there is a need to consolidate all these efforts into one portal.

Sports have always been the means to grow a healthy youth. In the Gulf countries, governments allocate massive funds to the support of sports and sports careers. This has the objective of directing the youth towards beneficial activities and away from other damaging activities.

The solution proposes the setup of an entity that is responsible for coordinating all information related to sports and publishing them under one portal. This portal would contain up to date information on the following:

- Each federation will have its own page promoting its activities, events and membership.
- Pages about sports events in Lebanon. This can even contain streaming video or audio commentary during the event or as an archive, after the event.
- Information about different sports teams in Lebanon
- Pages advising the youth on sports careers. Various schemes and programmes can be presented to help budding national sportsmen and women to develop a sports career or even a strong interest in a sport. They can also be guided into becoming coaches and officials.
- Sports facilities for the disabled
- Pages for trainers
- Sports equipment: skis, rackets, balls, etc.
- Educational sports pages: history, current situation, rules and regulations, key figures, equipment, etc.
- Listing of available indoor and outdoor sports facilities such as clubs, gyms, beaches, courts and other locations where sports can be practiced by the citizen.
- Listing of available sports coaches
- Linkage to sports pages in other countries to encourage sports tourism to Lebanon.
- Links will be made to sports activities in schools and universities.
- Links with academia for sports education
- Links will also be made to major world sports events to save the visitors time searching for them on the web.
- Information about sports books and libraries that have sports material.
- Booking of sports facilities online
- A special page will be setup for the Directorate of Youth and Sports to promote its own mission, activities and events.
- Setup a forum for discussions on various sports issues
- Setup chat rooms for sports groups

The site should also promote those sports that have not been in the main limelight in Lebanon with the hope that their federations would prosper and grow.

Public private partnership can be secured by having key sports material vendors support the site. Federations can also contribute according to their means.

3.39 Youth Network

Purpose: To youth with access to a variety of services, information and activities that would render their lives more meaningful.

Description: More and more, the youth of today are finding it easy and cheap to sit back and get entertained rather than be active and outward going. The purpose of this solution is to promote communities of youth that have outward going activities that can get them to be involved in healthy objectives. The Internet can then be used as a means of communication and source of ideas for activities rather than for its unsocial use as a source of effortless entertainment.

The purpose of this solution is to setup an entity which can be based on an NGO or a group sponsored by the private sector and strongly supported by the government. This entity would develop a web portal that is not the main focus of the solution but is the source of communication for youth activities.

The portal would cover such functions as:

- Discussions on the needs of youth where they can voice their needs
- Youth education covering issues related to formal education as well as general and information education
- Promotion of youth hobbies such as chess, stamp collecting, hiking, trekking, camping, sports (See the Sports Network solution), etc.
- Teenage Development Patterns: Physical, sexual, intellectual, social, emotional and moral development
- Pages on youth activities: where to find fun and learning and how to get involved
- Advisory channels: youth often face problems that are difficult to expose to family members or friends. They find it easy to resort to objective outsiders. This page would counsel youth on various issues, bringing problems out into the open, defining problems, clarifying their causes, proposing solutions and offering advice.
- Advice and information for parents
- Listing of all events of interest to the youth
- Links to such cultural activities of interest to the youth such as music, theater, dance, film festivals and art exhibitions.
- Setup a forum for discussions on various issues of direct interest to youth
- Setup chat rooms for youth groups
- Enhance the civic sense of youth by proposing activities for such issues as the environment, democracy, civic behavior, child labor, etc.
- Learning to drive
- Prepare the youth for their later years by offering information on educational steps (See the Educational Career Counseling Solution).
- Preparing youth for the national military service
- Health issues: prepare the youth to understand their health and its importance, identify key symptoms, discuss such sensitive issues as safe sex, psychological problems and drugs.
- Social issues: prepare the youth to understand such issues as

To involve youth, Links can be made to the following:

- The Volunteer Network
- The Sports Network
- The Charities Network
- Links to media that specialize in youth: press supplements, radio and TV programs

Along with the above, the entity handling the network would also launch

The main challenge of this solution is the setup of an entity or a body that sustains the results of the solution. Another challenge would be the ability to secure funding. Public private partnership can be secured by having vendors with youth products support the site. Banks and other private sector organizations can also contribute as the future of the youth is one of their interests.

3.40 Guide to International Relations and the Diplomatic Network

Purpose: To provide the citizen with necessary information about both the Lebanese embassies abroad and about foreign embassies in Lebanon. The network also provides visitors to Lebanon with essential information needed before their visit. Finally, the network also provides the basic vehicle for the day to day operations of Lebanese embassies.

Description: Currently, the Ministry of Foreign Affairs is involved with setting up a network that allows high speed connection to the various Lebanese embassies. The main purpose of this network would be to host the day to day operations of the embassies such as relates to human resources, correspondence, budget preparation, etc.

Such a network should be extended to include two general types of information. The first provides Lebanese citizens and private sector companies with information they would need in their international interactions. Secondly, the network would be the vehicle needed by international individuals or companies wishing to establish the first contact with Lebanon upon which they can be channeled to the proper authorities in terms of their visits, business, information collection, etc.

A wide function web site would be setup that covers the following functions:

- Embassy information pages: links to the web sites of individual embassies along with the presentation of information such as addresses, addresses, contacts, hours of operation, key persons, special services, etc. Also included would be information about parties that represent Lebanon where there are no embassies or consulates.
- Key country information about each of the countries where Lebanon is represented and links to web sites where such information can be reviewed.
- Definition of all services that an embassy can provide to Lebanese citizens such as the issuing of passports, powers of attorney, various authentications, etc. Downloadable forms should be made available for all types of requirements.
- Definition of all services that an embassy can provide to the citizens of the country the embassy is in that would cover such issues as visas, visiting terms and conditions, business interactions, etc.
- Visa requirements for the Lebanese to all countries in the world with either downloadable applications forms or links to where such forms can be obtained
- Visa requirements for various nationals wishing to visit Lebanon, where they can be obtained and the related charges. Downloadable forms should be made available for all types of requirements.
- Trade requirements that the business sector can use when dealing with other countries. These would cover trade and export rules, arbitration issues, etc. This web page needs to be closely linked with any related information presented by the Ministry of Economy and Trade, the Chamber of Commerce and Industry and other government agencies of interest to international business wishing to interact with Lebanon.

The above information would be the responsibility of the Ministry of Foreign Affairs. The main challenge would be to keep it up to date.

3.41 Technical Cooperation Network

Purpose: To provide information for planning, monitoring and evaluation of technical cooperation projects across Lebanon.

Description: This project would be part of an effort to create a centralized unit in the government to collect, analyze and disseminate information about progress in technical cooperation projects.

The unit would assist in providing information for the decision-making process in terms of planning, monitoring and evaluation across the different sectors. It is evident from many experiences in Lebanon that central and coordinated planning is lacking across sectors and cross sectoral.

The information network would be of extreme benefit to the different ministries and in particular to the Ministry of Finance to support performance based budgeting and better planning. This network would require the different Ministries and Agencies to supply it with the necessary information about project components, indicators, budget, and progress. This information would significantly contribute to progress in sectoral coordination.

3.42 Library Network

Purpose: To improve and increase access to various Libraries in Lebanon.

Description: Public Libraries in Lebanon are not very common. In the recent past, a few public libraries emerged as a result of municipality and government initiatives. University libraries are available and have a reasonably good standard.

However, all these libraries suffer from several issues:

- Lack of funding
- Not being up to date
- Not having a sufficiently wide range of material
- Resorting to traditional library material such as books and journals
- Lack of coordination amongst the libraries
- Restricted access

Libraries form a nervous system throughout a society. They are the basis of informal and formal education drives. In many instances, libraries become the center for other activities such as music listening, lectures and recently, web Information Access Points (IAP).

Libraries need to modernize and widen the scope of their facilities and services to include the following:

- Internet access
- Electronic databases
- Online search for and reservation of books
- Access to eBooks and journals fast becoming common
- Web forums for individuals and organizations working on similar research and issues.

- Knowledge management to provide information on new material, events and library usage techniques

The Government needs to invest in the development of a Library Network that allows the following:

- Increase the funding to develop all facilities listed below. This should be easily secured from major international organizations and donors.
- Widen access so that individuals or institutions outside a university or a particular organization can use its libraries
- Develop a coordination scheme to allow libraries to exchange books required by subscribers in different locations
- Support mobile libraries by the lending of books of suitable content for the readers of such libraries
- Improve the technologies used in libraries for better control and more flexible usage (Bar code reading, door checks, automated lending systems, etc).
- Promote electronic database access so that the various databases being developed in Lebanon, and through many of the proposed solutions, can be accessed through the library with ease.

The main challenge for this solution is the coordinating effort which seems natural to be hosted under the Ministry of Culture or the Ministry of Higher Education.

3.43 Setup Database of Studies, Theses and Articles

Purpose: To setup a database to be published on the web. The database would hold information about every project undertaken in Lebanon as well as articles and academic theses.

Description: One of the major problems faced by Consultants, Donors and various institutions whether in the private or public sector is the effort often duplicated because of lack of knowledge of work done by other parties. In Egypt, by the mid 90s, the Information Decision Support Center developed a simple database that resolved this problem.

The solution would be to setup a research unit to handle this task, ideally under such an Information Decision Support Center (Described in a separate solution). The unit would be supported by a web based database application. It may also be possible to reduce the effort of research by allowing the parties working on such projects, articles and theses to enter their own data which could be verified and confirmed before being released.

This application would have a record for each project, article or thesis completed in Lebanon. The range of sectors covered needs to be defined but can be quite wide, covering all issues of national concern.

The database would have a single page contain important information about each of these items. More importantly, such records need to be classified intelligently to allow fruitful search results.

The Egyptian experience paid back for the effort in no time by avoiding duplication and reverting to existing information. The main benefit would be to ensure that new projects, articles or theses are not embarked on if similar items had been already completed. In many cases, new projects may only need to update existing studies or work.

Furthermore, assigning financial values to the projects would lead to interesting national figures regarding expenditure in various sectors.

3.44 Online Commercial Registry

Purpose: To allow companies to be registered online.

Description: The Commercial Register in Lebanon is a department within the Ministry of Justice. There are 5 different and well near independent registers in the country. In the past, the whole process was manual. Recently, through a project executed by OMSAR, the Commercial Register is being automated. However, the automation is through an internal software application and is far from being web based.

The Commercial Registry process suffers from various shortcomings that need to be addressed before the full success of the online registry can be achieved:

- There should be an integration of the various registers to avoid duplication of names, consolidated checking of shareholders and standardization of procedures.
- The manual process itself must be simplified.
- Legal issues have to be resolved. For example, changes on the register require clearances from such sources outside the Ministry of Justice as the Ministry of Finance and the National Fund for Social Security. Both these are not related to the actual registry. There are other cases. Such issues have to either be relaxed or be executed by the web based system so that data exchange can be effected to internally and automatically acquire such clearances.
- Commercial registry information is public domain. The public cannot easily acquire such information from the current system. One or two private companies have taken it upon themselves to duplicate the information from the Ministry of Justice and offer it to the public against specific fees.

On completing the project, the following facilities can be made available:

- Full initial registration of different types of companies.
- Modification and updating of data such as location, shareholders, changes in legal status, capital changes, changes in internal constitutions, etc.
- Inquiries about trade names
- Reservation of new trade names (Time restricted)
- Full search and review by the public.
- Analysis of the registered companies by type, location, size, capital, etc.
- Company cancellation

The web based system would also be integrated with the Ministry of Economy and Trade's Trademark procedures to reduce the need to go from one Ministry to the other.

3.45 A Lebanese Gutenberg Project

Purpose: To convert into text books published in Lebanon that form part of its cultural heritage. The purpose would be to make such books available for research, audio conversion or plain reading.

Description: There is an ongoing project in the West that aims to convert all books which are out of copyright or whose authors grant that right into text form. Major works

are already available for free download. Visitors can visit the Gutenberg site and download any book of their choice. ([Click Here](#) to visit site).

The purpose of setting up the books would be:

- To protect the cultural heritage of Lebanon
- To make available the books to a very wide international audience
- To use the text with Arabic Audio Text readers (Covered in a separate solution)
- To provide access to books to those not able to buy them

The Gutenberg project has been a success. Individuals are contributing in the conversion creating a national civic sense. It can be repeated in Lebanon. In due course, Lebanon can be the leader in this initiative by converting other Arabic cultural heritage.

3.46 Setup Data Entry and Transcription Centers

Purpose: To position Lebanon as a regional data entry center and provide income generating activities mostly for the poor.

Description: This is more of a process than a system. Its purpose is to setup data entry centers in rural areas of Lebanon. Such areas are usually beset by poverty and urban migration. This solution addresses both issues and would in addition lead to the improvement of ICT literacy. It also addresses gender disparity issues.

A number of countries, namely India, have become data entry center for big corporations around the world. Lebanon is positioned very well to profit from such an opportunity at the regional level especially with Arabic speaking countries.

Data entry centers can be established in rural areas with relatively cheap overheads and salaries. People can be recruited and trained to perform simple data entry tasks and would be supervised by quality control staff.

The market would cover the Arab world with a focus on the language advantage, quality, and fast turn around time. This would be mostly a private initiative with facilitation by the government.

The mechanism is to setup centers made up of several PCs. Additional units such as scanners or printers can be introduced when needed. A supervisor will control the work. A workforce can be recruited from the region. Focus would be on women who are usually unemployed. Work can be carried out on a flexi-time basis.

Lebanon has already experienced this through a project carried out by InfoPlus. The project caters for both local data entry as well as that for European customers. Its model needs to be replicated.

3.47 Setup Job Opportunities Portal / Center

Purpose: To facilitate the matching of supply and demand for jobs in Lebanon.

Description: The job market today suffers from various problems. Lebanon still relies on word of mouth but is slowly coming out of the practice. This has been due to the increase in the number of recruitment agencies. Moreover, the National Employment Office has done a fair amount of work in this regard. This makes it a natural choice for hosting this solution. However, there is no reason why it cannot be shared with private companies.

The purpose of this solution is to make it simple for both employees and employers to match requirements. The web site to be developed will be public domain and will allow the following functionalities:

- Companies or public sector agencies can officially announce their vacancies. The vacancies will be setup on a database designed to allow flexible searching techniques.
- Recruits can also post their curriculum vitae using special entry screens
- Recruits can review company requirements
- Recruits can search the site for matching employers
- Companies can search the site for matching recruits
- Notifications by email can be sent to companies or to recruits whenever their search criteria are met

Neither companies nor recruits will be charged. However, to raise funds for this site may be made to allow companies additional advertising banners, photos and briefs at a nominal charge.

One of the risks this solution faces is the possible competition from recruitment offices. Their role is not to be ignored. Recruitment offices have the advantage of direct counseling and interviewing. This site would be to their advantage as they can collect their recruits from it. However, the charges such companies place on recruits or on the recruiting companies will not be related to the solution.

One of the difficulties of this solution will be the classification of jobs in a standardized manner to allow for proper matching. This situation is exacerbated by the need for a three language usage of the site as neither recruits nor companies are supposed to post their data in three languages.

An extension to this project will be made to participate with the activities of the National Employment Office. The latter conducts market studies and can have their results published.

One the major benefits of this site will be towards the ICT sector which has a relative high job turnover rate.

3.48 Manage ICT Resources in the Public Sector

Purpose: To have an up to date and accurate inventory of all ICT resources in current use in the Public Sector.

Description: Currently, OMSAR is undertaking a survey of all such resources in the government. The effort is worthy. However, it needs to be regularized and setup on a firm footing.

The following is proposed:

Stage 1: A database application would need to be developed to host all such data. It would cover software, hardware, networking items and related ICT resources such as those found in computer rooms, etc. The application would be setup on a web site and access to that web site would be restricted to key ICT Unit managers in the public sector.

Stage 2: A procedure would be setup for data entry. This would be backed up by a awareness and training drive to ensure its proper implementation.

Stage 3: The data would be verified to ensure proper entry and quality control.

The data can then be analyzed to achieve the following:

- Assess the overall range of ICT resources in the Government
- Plan for such issues as replacement, maintenance and support
- Plan for upgrades and updates
- Channel resources which may be unusable in on agency to other agencies which might have such needs
- Evaluate and plan for yearly ICT budgets

This would form part of an industry standard practice called Configuration Management. In due course, standards can be setup for ensuring that changes to existing systems take place under a standardized Change Management scheme.

3.49 Setup Document Tracking and Mail Registry Application

Purpose: To provide a system that can be used in any Ministry or Agency to track the progress of documents through their life cycles. The same system can be used to register all incoming and outgoing mail. The third aim would be to provide scanning facilities in case documents being tracked or registered need to be archived.

Description: This system combines three functions in one. It has been already applied in several agencies such as the Municipality of Jounieh (With the assistance of USAID). Other agencies have implemented the system. These systems share the following characteristics. They were mostly designed to be specific and not generic and hence cannot be used "As is" in other agencies. Secondly, not all these systems integrate the above three functions.

What is proposed is a system that works as follows. A database application will be setup to register all incoming and outgoing mail. This will be supported by an integrated application that allows an Agency to define key documents generically such as applications, requests, payments, etc. Say an Agency decided to track 10 of its documents. These will be setup on the database. Secondly, the Agency will then decide

on which tracking points to include in the life cycle of each document. For example, a typical document may be through 20 steps. However, the Agency only wishes to track its progress through 6 of these steps. The 6 steps will then be defined for that document. The person who is responsible for completing the work at each step is identified to the system. The same will be decided for the rest of the documents. As each new document is created, it is setup within the system. In some cases, when such a document is an incoming mail, it can start its life in the Mail Registry module. As the document progresses through the workflow in the Agency, each person responsible for a specific tracking point will enter information relevant to the completion of that step: date and time and remarks. Options will be allowed at specific tracking points to scan the document in case significant signatures, annotations or attachments are added to the document.

As in the case of the Jounieh Municipality, the owner of the document, usually a citizen or maybe a company, will be given an ID and a password. These can be used to track the progress of the document on the web.

The benefits of this system are the following:

- Accountability and transparency are improved
- Efficiency is improved by analyzing the turn around time of such documents
- It is sufficient to model the tracking points to recognize inefficiencies in processing documents. Such can then be addressed.
- Citizens can know at any time the status of their documents. This provides confidence in the public sector. Furthermore, it reduces the burden on the citizen to follow up at the premises of the Agency which in turn reduces the work load of the employees.

The system must be generic, which means it can be horizontally applied throughout the public sector. Future extensions may allow interagency tracking. In due course, the implemented systems can be incorporated into a comprehensive eGovernment portal.

3.50 Tourist Network

Purpose: Improve the exposure to tourism in Lebanon by disseminating information and services over the web.

Description: Lebanon has been struggling to rebuild its tourism sector that was one its key strong points before the war. It needs to revise its basis touristic practices such as high hotel rates, wider ranging services and information.

The online tourism information network addresses the latter challenge. It would contain significant information for tourists. Such information as the following would be useful:

- Tourist site information
- Leisure information
- Travel and transport information
- Visa requirements (Also linked to the Diplomatic network)
- Medical/Health information (Also linked to the Health network)
- Festivals
- Cultural activities such as art exhibitions, lectures and concerts
- Weather information

- Link to the Digital Cultural Heritage site or the Virtual Museum (A related solution).
- Statements by visitors to Lebanon
- Etc.

Where possible, the site would contain pages or link to pages that allow transactional services such as:

- Purchase of tickets to all events
- Airline reservations
- Car rental, tour, hotel and other bookings
- Etc.

Consolidating all such information into one portal would encourage tourists to seek such information and increase chances of being attracted by one or another service.

This site could be managed by the Ministry of Tourism and constantly maintained and updated accordingly.

3.51 The Citizen's Guide to Labor Relations

Purpose: To provide the employees and employers with wide ranging information that relate to employee/employer relations.

Description: The Ministry of Labor requires that all companies with more than 15 employees should have a Staff Regulations manual. This means that a large number of small companies in Lebanon does not have such a manual. Secondly, such manuals are either not developed, developed poorly or are not accessible to employees. When they are, they do not clarify all possibilities of working relationships. Finally, they are restricted to the laws and regulations issued by the Ministry of Labor.

There is a need for a wider knowledge base that makes the relationship between an employee and his or her employer more transparent and clear.

It is proposed that a web site be developed that contains such information. The information would be generic and would be restricted to existing Labor laws because companies have the right to provide additional benefits or regulations that do not conflict with those of the Ministry of Labor.

Such information as the following can be published:

- Indemnities
- Benefits
- Leave regulations
- Bonuses
- New decrees such as the recent one related to daily transportation
- Grievances and complaints and how to report them to the Ministry with the possibility of setting up a page for posting such grievances.
- Disciplinary actions
- Rules of conduct

Moreover, additional information not related to the Ministry of Labor can be published as related to the chapters and contributions of the National Fund for Social Security as well as all the benefits an employee can have from such the Fund.

3.52 Agrobus

Purpose: To provide much needed extension services for farmers.

Description: the Agorbus would be a vehicle visiting farms to provide advice on a number of farming issues. The bus would be equipped with all the necessary tools to provide farmers with immediate feedback when possible and delayed feedback when necessary.

The extension worker operating the Agrobus would use the test equipment to provide an analysis to farmers on soil condition, water resources management, environmental concerns, crops planted, type of chemicals used, markets available among others.

This extension service would work closely with the Lebanon Center for Agricultural Research to provide the analysis and advise to the farmers. On the same hand, the extension services would also serve as a data collection venue for the ministry of agriculture.

3.53 Encourage Media to Go Fully Online

Purpose: To encourage Lebanon's radio, TV and press media to go fully online.

Description: Lebanon has one of the richest and most experienced media in the Arab World and the region. Its radio, TV and press have taken a foothold in the region which could slowly be losing grip. Satellite transmission improved an already good situation. Already, such media have their web sites and publish their news in text form.

However, the current trend is to provide streaming audio and video as in the case of the key news media in the world: CNN, BBC, etc.

An effort should be made to provide such a technology as streaming audio and video at affordable prices to allow the media to go fully online.

A major challenge would be the international bandwidth needed to transmit such web broadcasts. This is a necessary requirement for this and other Solutions.

3.54 Judiciary Knowledge Base

Purpose: To setup and collect a knowledge base hosting a variety of Judiciary Information of major use to the Ministry of Justice as well as to the public.

Description: Currently and in the recent past, several initiatives have been launched to setup databases containing judiciary information. The Syndicate of Lawyers have a database of cases. Various parties, without coordination, have setup the Official Gazette (Al Jarida Al Rasmiah).

There is a real need to setup a judiciary knowledge base that contains the following:

- All laws and regulations in Lebanon
- The Official Gazette
- A history of all cases and their details
- A list of all parties involved in the legal system: lawyers, judges, public attorneys, etc.
- The Commercial Registry (As per a separate Solution).

This database would be of use to the Ministry of Justice, various government agencies and the citizen.

Furthermore, this site can be linked to another Solution's site: the Citizen's Guide to Legal Issues.

It will be coordinated with the solution that offers the Citizen's Guide to Legal Issues

3.55 Resolve Administrative Anti-Patterns in the Public Sector

Purpose: To commence with a drive that reforms the administration in key areas. The objective here is to identify bottom up administrative reform activities.

Description: A new management term arose in the past 5 years: patterns. These are repeating procedures or activities that retain their structure from one department or organization to another. Most organizations became concerned with improving their patterns using the experience gained from others. In time, another term arose: Anti-Patterns. This signified those patterns that work against the organization and are symptoms of its ills.

There are many anti-patterns in the administrative culture of the public sector that are behind grave inefficiencies. These can be generically grouped as shown below. Each of these anti-patterns can be found in many Ministries or Agencies. Resolving such anti-patterns would lead to:

- Increased efficiency
- Reduced burden on the citizen
- Transparency
- Accountability
- Increased flexibility for future and more global reform

This Solution starts by launching a major project within OMSAR in coordination with the concerned Ministries and Agencies. The project would go through the following stages:

Stage 1: The project team would elaborate each of the following patterns and ensure that the list is comprehensive. There might be more than those listed below. Furthermore, anti-patterns may be found in specific areas to be addressed in a phased manner. For example, an initial phase of the project would address administrative anti-patterns while a latter phase can address those found in financial work or ICT activities.

Stage 2: A team would review the procedures of all Ministries and Agencies and prepare a matrix showing the anti-patterns found in each Ministry or Agency.

Stage 3: The team would prepare solutions that resolve such anti-patterns for each institution. In general, similar solutions may be needed. However, there would be some institutions that require specific solutions.

Stage 4: The Minister or Director of each institution would then be required to resolve the anti-patterns by issuing the proper decrees, instructions and guidelines.

Stage 5: The team would setup monitoring activities to ensure that all anti-patterns have been removed.

It is important to realize that this Solution does not address the overall reengineering of a department or a process. It is only meant to identify specific anti-patterns and remove them. Another issue is critical. This is not a quick fix solution. Removing anti-patterns is one of the key techniques of improving business processes.

Typical anti-patterns:

- 1. Offloading work onto the citizen:** This is one of the major ills in the public sector. Examples are many. In many Ministries, the citizen cannot pay directly in the Ministry but has to travel to the Ministry of Finance and return with a receipt.

Solution: Absorb the work internally. A Ministry can be authorized to receive money on behalf of the Ministry of Finance and forward it the sums at a later stage. ICT systems can enable such a process with ease.
- 2. Multi-Agency Processes:** Many processes require the citizen to roam from one agency to the next. The citizen has to submit a request to the Official Gazette when acquiring a trade mark.

Solution: Each process must be owned by a single Ministry or Agency. It remains the responsibility of that Agency to carry out any "background" Agency hopping.
- 3. Excessive Controls:** Excessive and inefficient controls do not remove abuse. Furthermore, their cost is usually higher than the cost of the abuse they are supposed to remove.

Solution: Transfer the controls from human hands to robust ICT based systems. Checks can then be built into the software obviating the need for multiple signatures and validations.
- 4. Processes with displaced controls:** An agency that fails to monitor and control its work will often request another agency to trap its defaulters. The primary process becomes encumbered by secondary controls that are of no relevance to it. When updating information on the Commercial Register, such as the location of the company or its shareholdings, the applicant must submit a clearance to the Ministry of Justice from both the Ministry of Finance and the National Fund of Social Security.

Solution: Remove the displaced controls from the primary process completely and improve the secondary controls in their original locations. Alternatively, use the data exchange Solution presented separately to check such issues.
- 5. Duplicated Information:** Processes often result in duplicated information because Agencies do not trust each other's information. This results in repeated

reconciliation, duplication of data and time loss checking. Witness the large number of agencies that use the Citizen's ID using their own codes. This is rightfully owned by the Ministry of Interior. GIS is another case in hand.

Solution: Identify the rightful owner of the information and ensure that such information is totally handled by that party. In due course, it will be the responsibility of that party to distribute this information to others who may be using it.

6. **Multiple transcriptions of data:** Examples can be given of a single transaction that has to be manually recorded on the daily register, the receipts register, the register of the transaction itself and the register to be sent to the Ministry of Finance. (Even with the reengineering of the postal services with Libanpost, receiving a registered letter requires no less than 3 transcriptions.)

Solution: Develop minor databases that have a single entry screen which can automatically distribute the data to various registers.

7. **Authentication:** A fair amount of time is wasted authenticating documents manually and through lengthy and distant visits. When setting up a new non-profit organization with the Ministry of Interior, the founding members are required to submit an up to date ID transcript (Ikhraj Qaid) and a Judiciary Record (Sijil Adli). Both these documents are available with the same Ministry.

Solution: There are several solutions for this anti-pattern:

(1) Use novel procedures for quickly acquiring authentication. For example, a citizen can print out his or her Judiciary Record on their PC at home after accessing a secure web site and using their ID number. The printout can be produced at home using a ciphered bar code that provides all necessary information but is chaotically printed in a manner that cannot be decoded. Only a suitable bar code reader in recognized locations in the government can authenticate the document. No need for signatures or stamps. Suitable dual serial numbers can also be verified so that no tampering with the document can take place.

(2) Use ICT based applications that allow agencies to authenticate various issues online. For example, the Ministry of Interior can easily setup a secure database containing data about citizen IDs. This can be accessed under suitable security measures by any agency wishing to authenticate a particular citizen's applications. Alternatively, implement the ID Smartcard.

(3) Allow for online application for authenticated documents followed by a manual visit. This cuts the effort and time in half.

8. **Multi-Visit Procedures:** An annoying anti-pattern is the need to visit a specific agency several times. The reasons are many. Ignorance of procedures is one of them. Application submission and collection on a different date are another. Lack of agreement on what is required is a third reason. (There are 3 different lists of requirements for renewing a labor permit in the Ministry of Labor: one on the wall, one on a preprinted card available at the counter and a third in the mind of the employee who will cross out items from the preprinted card at will).

Solution: This anti-pattern can be resolved in different ways depending on the cause of the multiple visits. The INFORMS site can be used to ensure that procedures and documentation are both valid and definitive. Applications can be submitted online and collected through one visit.

It is definite that there are more anti-patterns than the above. These can be addressed during Stage 1 of the Solution.

3.56 Establish a Country Development Gateway

Purpose: To setup a locally owned and operated initiative that explores and determines development priorities and opportunities and act on them.

Description: Country Gateway portals feature local resources on key socio-economic development issues such as poverty, unemployment, gender, etc. They contribute to creating and sharing local and global development knowledge, solutions and opportunities. This site would also provide information about current projects in Lebanon and those in the pipeline. It will present some of the issues that are important to socio-economic development with links to relevant sites and examples of projects in other countries.

The portal will feature local resources on key development issues and contribute to creating and sharing local and global development knowledge, solutions and opportunities. It is also a portal on development issues from which users can access information, resources such as research, papers, studies, etc. Tools will also be presented such as those for participatory monitoring and evaluation, community development, etc.

The main beneficiaries of this gateway would be all organizations and individuals interested in socio-economic development to include government, NGOs, donors, private organizations, research institutions among others.

This site would be developed by the private or NGO sector and endorsed by the government along with other partnerships. The maintenance of such site and the frequency of its use will be a key to its success.

3.57 Social Affairs Information System

Purpose: To improve the efficiency, effectiveness and transparency at the Ministry of Social Affairs

Description: Establish a management information system at the Ministry of Social Affairs to combine the existing management information systems spread across the ministry and add the necessary and missing elements. The combination of existing, planned and needed systems are:

- RAIS (Rights and Access Information System)
- NGO database and processing
- Administrative Information System
- Social Development Centers

The existing information systems at the ministry are not linked together and therefore do not allow for synchronization of information and the ability to analyze the data. Information about NGOs, services provided, administrative and budgeting planning and monitoring, decision-making among others, need to be well coordinated.

Such an effort would render the Ministry and its services more efficient and effective. It would also assist the ministry to assess social spending, restructure services, developing a social policy, etc.

3.58 Informal ICT Training Programs

Purpose: To offer a comprehensive and affordable ICT basic skills training program aimed at the general population.

Description: In Lebanon, ICT skills are being acquired mainly through formal education. Training Centers are the only vehicles available for acquiring the ICT skills of the general population. Training Centers have several major inconveniences. They are expensive and cannot be justified for most members of the society who want to acquire ICT skills, they are located in the capital Beirut and they usually offer instruction at times inconvenient to the general public.

ICT training is a major enabler of the spread of ICT into society. The majority of the population is aged thirty and above and did not have the benefit of a formal ICT education in schools. Furthermore, there is a psychological resistance to technology when it is not familiar. The same person who would not hesitate operating a DVD player and a programmable VCR would halt when faced with a personal computer.

The project will identify venues for affordable ICT education aimed at the general population and fund or subsidize them. The program will be aimed those above thirty years of age. The program will also focus on rural areas. A target for the number of people trained will be set. The number should be not lower than 2000 per year. The program shall be planned for three years with a growing year target.

The solution can be implemented through the following means:

- Partnerships with universities to provide ICT training as part of their continuing education programs.
- Partnerships with existing or projected mobile units to reach remote areas.
- Subsidizing the tuition fees of certified training centers when the student comply with special criteria of age and income level.
- Coordination with the National Employment Office to offer the program to the unemployed.
- Partnership with public libraries, municipalities and community centers who are natural providers for such affordable ICT training to the population.
- Partnership with ICT companies who can view such programs as means of promoting their services.
- Promotion of the programs through the media (As discussed in a separate solution).

The program will use the national recommendations for ICT training as the specifications for the providers of ICT training for the general population. The national recommendations for ICT training are called the "ICT passport" or the "Public ICT Literacy Syllabus" and are presented in a separate Solution.

3.59 ICT Skills Portal

Purpose: To provide a portal that leads Lebanese citizens to online learning of ICT skills.

Description: There are many sites that have a wide range of ICT skills training courses online. These are usually offered at very low prices. For example, the ICT Portal training section provides more than 400 PC based courses at a yearly charge of around \$100. ([Click Here](#) to visit their site) Others are free such as that provided by Barnes and Noble University ([Click Here](#) to visit their site).

The key feature of this project is to acquire subscriptions to various chargeable sites and follow the scheme below to allow access to them by the citizen.

The Solution proposes a project whereby the following can be achieved:

- An entity to be setup to handle all such functions, keeping the portal up to date and monitoring its use.
- A page will be provided for citizens to register so activity can be monitored and facilities announced as and when they are acquired.
- The entity would research all free portals and collect them as links on one page with brief instructions and guidelines.
- The entity would be funded to subscribe to those portals that are chargeable. Several subscriptions can be acquired for each or multiple licenses where available.
- Citizens can then log into the portal and select a course to train on. The web site will be programmed to automatically link to the required service, if chargeable, blocking further use of that particular password by others. The password will therefore be protected and only those logging into the main Lebanese portal can use them.

The portal would be widely advertised and would be available to all citizens.

3.60 Launch National ICT Professional Association

Purpose: to launch a national association for ICT professional whose purpose would be to create an ICT community.

Description: Currently, there are 3 associations in Lebanon that deal with various ICT issues. However, all three associations are based on institutional memberships (Although some encourage individual membership). Much beneficial work has been completed by such associations and it is predicted that their roles will duplicate that of the proposed association.

What is needed is an ICT association for professionals based on individual membership. The difference between such a national association and the already existing associations is that individuals would cooperate to further the causes of the ICT community as a whole. Such an association would have the following mission:

- To create an ICT community and establish communications lines between the various stakeholders of ICT in Lebanon.
- To assist in the development of various standards related to the community such as Job Classifications, ICT company classification, the classification of products

and services. These can be used by other solutions such: import/export statistics, Lebanese web site guides, etc.

- To develop criteria which allow ICT professionals to progress through recognizable career paths. This has been a problem in other industry where experienced professionals were often disadvantaged because of lack of proper educational qualifications. Creating the necessary equivalences and tests would allow such individuals to promote their professional status.
- To host the effort of gather data and information related to ICT proposed in a separate solution.
- To host regular lectures, talks and conferences.
- To issue newsletters and journals highlighting ICT in Lebanon and introducing emerging technologies.
- To host the Job Opportunities initiative proposed in another solution.
- Look into the status of ICT training companies and help them in terms of training their trainers, providing them with products and improving their facilities.

Models can be learned from such as the British Computer Society (BCS), the Association for Computing Machinery (ACM) or the Institute for Electrical and Electronic Engineers (IEEE). Cooperation with the Order of Engineers would cover the overlap in function as many engineers are also ICT professionals.

3.61 Improve Software Development by Following the CMM™

Purpose: Software development is a major hindrance to proper implementation of software applications. The aim of this solution is to introduce software developers in both the private and the public sector to modern software development processes.

Description: The Software Engineering Institute in the Carnegie Mellon University is one of the major centers involved in improvement of all aspects of software engineering. A key effort is their development of a Capability Maturity Model™, the CMM. This is a 5 stage path through which an organization can progress in terms of its software development capabilities or maturity. Very clear and specific activities are defined to allow development units to progress from one maturity level to another.

Software development in Lebanon is still not very advanced. Most companies and public sector agencies would fall into the Level 1 of the model, ie, would have a lot to benefit from progress to levels 2 and 3.

The Professional Computer Association (PCA) has already developed efforts in this direction by setting up workshops to train its members in the steps needed to progress from one level to the next.

The solution proposes a major drive, subsidized by the Government, to initiate CMM training workshops. These would be initially aimed at ICT units in the public sector. They should also be opened up to individuals who are not currently employed. Both these would be at no charge. The private sector should also be encouraged to attend these workshops and may be charged nominal fees to cover costs.

3.62 Improve Project Management in ICT Units

Purpose: Many ICT projects fail due to improper project management. The aim of this solution is to introduce ICT Units in both the private and the public sector to modern project management techniques initiating standards along the way.

Description: ICT projects have traditionally been managed by technical persons whose main concern has mostly been to manage the “product” development and not the project itself. Such technical persons lack project management skills. Furthermore, the public sector does not have project management standards and would therefore not be ready to implement project management methods and techniques without them.

The aim of this solution is dual. As a first step, the public sector should establish project management standards. These consist of agreed upon phases, forms and various methods to be used. Minimal requirements for each project would be defined. This effort can be part of an extension to the ICT Standards and Guidelines project under execution by OMSAR.

As a second step, project management workshops can be setup for ICT Units in the public sector. These workshops will concentrate on project management. It will also cover training on standard software tools available to the government.

This effort will be coordinated with the other Solution that recommends the introduction of CMM training for software development units.

Finally, upon the success of such workshops, they can be expanded to train project managers in other fields than ICT in the public sector.

A workshop has already been given as part of the EU’s ARLA program. This was attended by around 20 persons, mostly non-ICT.

3.63 Low Income Family PC Kit

Purpose: To provide family PC kits that will bridge the digital divide within the country and encourage the use of ICT technologies by low-income families.

Description: The project will distribute an PC kit made up of a Personal Computer, printer, UPS and a free internet subscription for one year.

The project will first determine the pre-set income level of the household that may benefit from the program. Then the project will determine the total number of toolkits that will be distributed through the program. Finally the project will decide on the allocation of the toolkits throughout Lebanon with priority given to remote rural areas.

In order to qualify for the program, a household must go through the following procedure:

- Apply by writing a statement explaining the need for or the intended usage of the kit.
- Two members of the household must attend the ICT basic skills training planned for by the program. One of the two attending must be the father or the mother. The two must show interest and have a good attendance record to the ICT

training. The training will include instructions on the assembly and installation of the PC kit at home.

- The training will also cover such home PC usages as: correspondence, home economics, using the Internet, health issues, chatting and communications.

The project will select the recipients of the toolkit based on their needs, their performance in the training session, and the area in which they live.

Three other projects are related to this project:

- The combating of various types of illiteracy through the development of CBT and eLearning applications.
- It can also be linked to the project that channels second hand equipment.
- Finally, it can be linked to the project that coordinates ICT donations.

The above will partly alleviate the the main challenge of this project which would be the funding and the sustainability. Furthermore, PCs and their software will need to be updated.

3.64 Disability Legal Framework

Purpose: To develop the necessary laws and regulations needed to improve the employment of the disabled as well as their day to day environment.

Description: (This Solution is part of 4 projects that aim at improving the situation of the disabled by providing them with information and counseling, creating opportunities for their employment through the use of ICT as well as through improving their ICT competence).

Disability is a condition caused by an accident, trauma, genetics, age or disease, which can affect or limit a person's mobility, hearing, breathing, language, vision, speech or mental function.

One of the underprivileged segments of society is the disabled. Digital and other divides exist for this part of society. This segment covers all age, economic status, location, gender or education brackets. Two myths are associated with the Disabled:

- People with disabilities have lower job performance ratings and lower job retention.
- Accommodating employees with disabilities is expensive.

Both of these have been proved false in studies carried out in the West. (National Organization on Disability 2001).

The following activities are pre-requisites for the remaining 3 Solutions:

- Improve the general environmental requirements for the disabled through a legal framework that makes such facilities mandatory.
- Make ready the legal framework needed for employment of the disabled.
- Implement employment laws and regulations and monitor them.

A promotional campaign would be required to increase public awareness of such employment and environmental requirements.

3.65 Disability Training, Counseling and Technology Center

Purpose: To setup an entity that manages a center for the disabled. This center would have 3 main objectives: training, counseling and the advancement of technological resources.

Description: (This Solution is part of 4 projects that aim at improving the situation of the disabled by providing them with information and counseling, creating opportunities for their employment through the use of ICT as well as through improving their ICT competence).

Disability is a condition caused by an accident, trauma, genetics, age or disease, which can affect or limit a person's mobility, hearing, breathing, language, vision, speech or mental function.

A center needs to be launched to provide the following 3 services:

Training of the Disabled:

- To train the disabled in basic ICT skills using the accessibility features of different products. This would improve their employment chances in general job situations.
- To train the disabled in specialized ICT competencies and therefore allow them to be part of the national ICT workforce.

Counseling of the Disabled:

- Advice and guidance as relates to the job situation of the disabled. This would cover legal rights, guidance in selecting jobs, guidance in acquiring the right training for specific capabilities or disabilities.
- Advice on the availability and selection of jobs
- Directing the disabled towards the proper medical services
- Directing the disabled towards the proper equipment and therapies

Technology Center for the Disabled:

- Allow Lebanon to transfer and import technologies, ICT or otherwise, that are suitable for the disabled.
- Research can be carried out in such a center, especially as relates to localization issues.
- Training can also be carried out in such a center on special technologies for the disabled.
- Samples of new technologies can be exhibited for trials before acquisition.
- Promotion of new technologies, ICT or otherwise.

The Solution is badly needed and can easily be supported by the private sector, the health and insurance industries.

3.66 Disability Resources Portal

Purpose: To develop the necessary laws and regulations needed to improve the employment of the disabled as well as their day to day environment.

Description: (This Solution is part of 4 projects that aim at improving the situation of the disabled by providing them with information and counseling, creating opportunities for their employment through the use of ICT as well as through improving their ICT competence).

One of the underprivileged segments of society is the disabled. Digital and other divides exist for this part of society. This segment covers all age, economic status, location, gender or education brackets. Two myths are associated with the Disabled:

- People with disabilities have lower job performance ratings and lower job retention.
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Both of these have been proved false in studies carried out in the West. (National Organization on Disability 2001).

Disability is a condition caused by an accident, trauma, genetics, age or disease, which can affect or limit a person's mobility, hearing, breathing, language, vision, speech or mental function.

A web based guide to the resources for the disabled can be setup. This would include such information as:

- Available training facilities
- Equipment for the disabled including where they can be purchased in Lebanon and/or abroad
- New technologies that assist the disabled
- Medical advances for disabilities
- Medical services for the disabled in Lebanon
- Counseling services for the disabled such as charities, hospitals and private clinics.
- Job opportunities for the disabled. This is a dual purpose page that allows companies to advertise their requirements and the disabled to advertise their profiles.
- Links to international related sites
- Sports facilities for the disabled

The main challenge to this Solution is cultural as Lebanese society has yet to recognize the seriousness of the disparities facing this group.

3.67 Virtual Citizen Communities

Purpose: To allow Citizen to Citizen communications through the use of web based forums. The purpose would be to facilitate open and free communications between communities interested in similar social issues.

Description: Lebanon is made up of many smaller communities that are isolated from one another. Such communities have an internal need to communicate, as long as that does not isolate them further, as well as an external need to be understood by others.

Virtual Communities is a facility that is provided free of charge. It is already in excessive use throughout the world through user groups, weblogs (See below), chat rooms and forums. Often, it is key portal providers that provide such services. However, this can be made available by service providers in Lebanon.

Virtual communities are known to have the following benefits:

- Spread informal knowledge and information
- Increase democracy and transparency by bringing out issues into the open
- Build closer educational ties between teachers and their students
- Build closer professional ties within professional communities
- Reduce the digital divide and other disparities by exposing communities to one another

Using the facilities of virtual communities listed above is a simple matter. The Solution proposes a promotional awareness campaign based on several pilot projects.

Definition: A weblog is a personal or noncommercial web site that uses a dated log format. It contains links to other web sites along with commentary about those sites. A weblog is updated frequently and sometimes groups links by specific subjects, such as politics, news, pop culture, or computer issues.

Weblogs were limited by the fact that such sites had to be developed. Recently, there has been an exponential rise of weblog sites due to the introduction of various weblog generating applications. Blogger, for example, is in use by over 750,000 users.

The rise of tools like Blogger also changed the content of weblogs. While they had begun as link driven sites offering alternative viewpoints on news and other subjects, weblogs began to collide with online journals. Blogger style tools allowed links and commentary to quickly grow into longer essays and diaries on the Web.

3.68 Students Online Loans

Purpose: To consolidate loans available to students into one web site.

Description: With the rising cost of education, student loans from Banks and other institutes are on the increase. The Lebanese Government should also encourage the facility of micro-lending for students. This can be achieved through tax exemptions for institutes that do provide such micro-lending. Many charities also provide such lending.

The web site will publish the names of all such institutes. Loan conditions will be clearly setup. The procedures for loan applications will all be automated to be available to students online.

On finding an applicant suitable, an institute can proceed to complete the loan procedures manually.

The scope of the loans should be wide allowing for high school, vocational, special purpose learning and university loans.

3.69 Launch Lebanon Based International Call Centers

Purpose: To launch a new service whereby international companies can move their call centers to Lebanon.

Description: Currently, many companies in the West have diversified their markets to cover the globe. This means a wide spread in customer support. Secondly, it means working through different time zones.

The solution to this set of problems was to establish international companies that specialize in customer support (Call Centers). Ireland became a key country for such services. Large US based companies would contract a call center company in Ireland for such a service. They would train its staff and channel all incoming support calls to Ireland. Because the international call center company has a wide service, its costs would be much lower. Secondly, moving around the globe, different time zones can be addressed so that customers can call at any time.

Lebanon can have this facility. It requires a private sector initiative. However, the government should support the drive by simplifying all commercial and legal issues related to working out of Lebanon. A second pre-requisite would be the increase in international bandwidth to allow for online diagnostics and video conferencing if needed.

Lebanon has the added advantage of a well educated young population that speaks 3 languages providing it with a wider range of targets that competing countries like Ireland or India.

3.70 Charity Services Network

Purpose: To promote and facilitate charities in Lebanon and expand their services and to encourage active citizenship in which citizens and the private sector feel they have both the opportunity and responsibility to contribute to such charities.

Description: Various charities exist in Lebanon. Fund collecting is a major requirement that feeds their charitable effort. One of their key problems is promoting their image and getting to the right donors.

There is a need to establish a network of charities available to the citizen or the private sector so they can decide on the best target for their contributions.

A web site can be setup following similar examples in the west where contributions can be sent via credit card payments. The following functions would be needed:

- Provide a detailed list of all charities
- Provide the citizen with the means of responding online to such opportunities
- Provide the means to register new charities on line
- Provide an online channel for schools and youth groups to support charities in their work by providing community service
- Link with international charities

The above activities would also encourage the collaboration of government, NGOs, the private sector and the media to promote and facilitate active citizen participation through charities.

The main challenge is to secure the funding to make all of this possible.

3.71 Link to International Networks

Purpose: to support development in Lebanon through networking worldwide and sharing experiences with other countries.

Description: A number of such networks exists and has proven to be beneficial. The example below is that of Delnet (Development eLearning Network) supported by ILO.

Delnet supports local development and decentralization by enhancing the capabilities of local players through training, information, technical consultancy and networking.

Local development initiatives and strategies initially concentrated on a territory's economic development. Their main thrust was to implement job creation measures. These measures then began to broaden their scope. They began to take an integrated development perspective that goes beyond the purely economic context to build "human" and social development. In this perspective, participation by all the players in civil society and the local socio-economic fabric is an indispensable condition for the sustainability of development.

Local development thus becomes a tool of consultation and social dialogue. It places responsibility for designing and implementing sustainable development strategies in the hands of its beneficiaries, the local players.

One of the pillars of local development is the mobilization of a territory's inherent potential, the strong points of each local environment, to enhance the quality of life of its inhabitants.

This inherent potential is taken better advantage of when there is contact and relationship with other places, regions and countries: acting locally and thinking globally. The local level is often geographically isolated and outside the main channels of information. This impedes access to skilled human resources and to specialist knowledge and information, which are essential to giving development momentum.

The intranet of Delnet contains:

- The Virtual Information and Documentation Centre (Infodoc) is an electronic library that gives direct access to numerous documents in electronic format on development- related issues- in English, French, Spanish and Portuguese.
- The Electronic Debate Forum on Local Development (Forum): an open space for direct debate among DelNet network participants, as well as for the exchange of relevant information on training opportunities, funding etc.
- The ABCLinks database, which contains the e-mail and web site addresses of relevant local development institutions and organizations.
- Access to the Habitat (United Nations Centre for Human Development), Best Practices. ([Click Here](#) to go to the site).

- Database, which catalogues more than 800 case studies and successful projects on the improvement of the quality of life in human settlements.
- Access to UNPAN - United Nations Public Administration Network. ([Click Here](#) to go to the site).

Lebanon should be part of such a network and should invest in developing its own resources in Arabic.

3.72 Disseminate Statistics of Ministry of Social Affairs

Solution: Provide better access to the social and economic information study prepared by the Ministry of Social Affairs. Improve access to vital information about the status of the social and economic situation in Lebanon.

Description: The volume of information and analysis prepared by the ministry of social affairs is significant and useful. The information is currently available in a number of book volumes from the ministry.

A web page linked to the planned site of the ministry of social affairs could provide crucial information for researchers. The content could also be enhanced by additional graphics and charting relevant to the analysis provided in the books.

The webpage would be supported in the background by a database that contains all the data. While the current data is contained in a number of spreadsheets, migrating them to a database would also give the ministry the ability for further analysis of the data, which would be reflected on the webpage.

The web page could also contain a more advanced function of what-if analysis so that the user is able to look at different scenarios of socio-economic impact while making assumed changes to the data.

3.73 Online Official Gazette

Purpose: To make available to the public the Official Gazette (Al Jareeda Al Rasmiah) online.

Description: The Official Gazette is issued by the Office of the Prime Minister. It is published by a private company on a weekly basis. It is still published in hard copy form and its subscription costs around \$150 per year. The size of the historical set is now so large that searching for laws, regulations and other announcements can be very time consuming and may also lead to errors and omissions.

Several sources in the recent past have taken it upon themselves to convert the Gazette into a searchable electronic form. Some have scanned the pages which results in unsearchable matter. Others have taken the trouble to enter the full text electronically.

This Solution proposes the setting up of the full Gazette on a special web site. This web site would provide a powerful Arabic search engine to facilitate research. It would also present the Gazette through keywords for linked searches.

In due course, it may be beneficial to publish the Gazette in both French and English.

3.74 ICT Training and Incentives for Public School Teachers

Purpose: To prepare teachers in the Ministry of Education in the implementation of the new OCT curricula of ICT and the expansion of their career options.

Description: The project aims at transforming the current overflow of teachers into both a means to promote the new ICT curricula in addition to providing the teachers with the possible alternative potential of moving into new careers.

A number of these teachers can provide teaching services in ICT for the increasing numbers of technical schools that are now spreading across Lebanon. This is an opportunity that both the teachers and the government could capitalize on to improve their performances and therefore benefit the citizens.

Currently, there is no initiative for such teachers to acquire such new knowledge. Secondly, there is no robust program for training the teachers. The causes are many and include low benefits, lack of access to ICT resources and the slow pace of introducing the new ICT curricula.

Challenges related to ICT resources can be resolved through separately presented solutions. Secondly, incentives should be given to teachers to learn ICT and instruct it. Finally, a close coordination should be made with ICT literacy standards to ensure that an ongoing update of the knowledge is sustained.

3.75 Prepaid Charge Card for Public Sector Transactions

Purpose: To setup a charge card that is prepaid and which can be used for all government fees, charges and taxes.

Description: One of the major annoyances in public sector transactions is the need to buy financial stamps to be stuck to various transactions as proof of payment. Problems arose with fraud, loss and the rising cost of reconciliation. Another issue was the difficulty of acquiring statistical analyses.

The first objective is to launch a project that issues a prepaid card that can be used for all government charges. All points that require payments will be supplied with swipe machines that can record the transactions into a centralized database as with the case of credit cards. The experience of the two major credit card companies can be exploited and may also be used to facilitate this project. The card can also eventually be used on all government web sites as a credit card for payments.

The card can be issued in several denominations and would be made available in most outlets around government offices that already provide services such as provision of stamps, copying, etc.

This Solution is modeled on Dubai's @Dirham project.

3.76 Implement a National ID and Smartcard

One of the key issues in any country is the identification of its citizens. Lebanon has faced severe problems in this regard. For a start, there is constant disagreement about

the validity of various identities. This state was exacerbated by poor control during the civil war.

There is no replacement for a national ID card based on a robust civil register. The benefits of such an ID are the following:

- Reduced need for authentication
- Tracking of citizens' transactions
- Reduced duplication for identity which is common in different agencies

The Ministry of Interior started the process of producing a National ID. However, not all the citizens have received their ID yet.

In the meantime, the Ministry has also started an initiative to produce a Smartcard which can eventually replace the ID. The Smartcard can and will contain information about each citizen for later use in terms of knowledge or authentication. For the time being, this is still in its experimental stages. The exact data elements to be included on the Smartcard are being analyzed.

The recommendation here is to proceed with the following:

- Finalize the registry so that all citizens in Lebanon have an ID card even if it is manual
- Revise the necessary legal procedures needed to remove the burdensome authentication required from the citizen even if the ID is produced. The ID becomes the final and only reference in all public transactions.
- Coordinate with the Data Exchange project presented as another Solution to identify the data elements needed on the Smartcard.
- Produce the Smartcard

Most countries in the region have resolved this issue. Egypt has managed to complete this for its 60 Million citizens producing an ID for all companies as well.

3.77 Increase International Bandwidth

Lebanon needs more international bandwidth for voice and data circuit. The current data international bandwidth is 0.0108 Gbps. Even with the current expansion announced by the MPT of an additional 0.108 Gbps, this bandwidth remains very low.

Lebanon is losing income because of the restricted international bandwidth. Increased bandwidth would result in the following revenue opportunities:

- Lebanon has sophisticated media (Radio, TV and the press). These can reap benefits for Lebanon Increased if streaming audio and video are made available online.
- ICT companies are mature enough to sell their products and services regionally. However, they are hampered in this by the need to provide online support, diagnosis, upgrades, etc. Much can be reaped if the bandwidth is made available to such companies. (ASP, software applications, etc).
- Regional services provided by Lebanese sites can be made available at better connections. (Banking, auctions, eCommerce, general information).

Furthermore, if ISPs are given special reduced rates for their international connections, this would be reflected on lowered subscription rates leading to increased internet penetration.

3.78 Post .lb Domain Names for Sale

Purpose: To result in increased revenues for Lebanon.

Description: Although this Solution does not have a direct impact on any of the 7 initiatives, it is seen as a direct way to increase Lebanon. The precedence has already occurred when Tuvalu, a small island that thrived on tourism and the sale of stamps, realized that its domain name extension of .tv can be used by the various media. It promoted the use of its name internationally and sold domain names.

Lebanon is also lucky in that .lb can be viewed as the abbreviation of "pound" and hence be attractive to the increasingly large number of web sites devoted to diets and weight watching. The solution would emulate that of Tuvalu. Its main challenge would be one of promotion and the availing of the registration without complex procedures.

4.0 Specific Recommendations

Recommendations cover direct proposals to the Government. In most cases, these are to be implemented as guidelines, decrees or decisions and not as projects. (The latter are the subject of the following section).

4.1 Improve Efficiency of Government Telecommunications Providers

Currently, there is widespread concern about the efficiency of providing services by OGERO and the MPT to their customers. Leased lines take weeks or months from application date to date of usage. Billing is still primitive providing customers with very little information about their usage.

The procedures of OGERO and the MPT should be reengineered to improve turn around time.

4.2 Improve the Utilization of the Land Line Network

Lebanon has spent around \$1 Billion on its existing land line network. The utilization is stable at 48% (681,000 / 1,400,000 lines). This means that Lebanon has not reaped its return on investment. This low Teledensity has also resulted in a restriction on internet penetration.

It is essential to develop marketing strategies aimed at increasing the use of the existing capacity. The following can be undertaken:

- Promoting the increase of subscriptions
- Establishing low entry charges to encourage home and business use
- Providing additional services and facilities not available in Lebanon: detailed billing, suspended services, audio announcements in case of change of telephone numbers, etc.
- Provide special block rates to increase usage at off peak hours
- Provide hunting lines at no additional charge

Among its many benefits, this will also increase revenue for the Government.

4.3 Amend Building Laws to Cover ICT Usage

Currently, buildings have laws that relate to electrical practices and standards dating from pre-ICT periods. New buildings are being built without the proper conditions needed for healthy ICT equipment and usage.

It is recommended that Building Laws be amended, for both existing and new buildings, to cover the following issues:

- Proper Earthing
- The use of 3 line cabling for safety and noise reduction
- Lightning protection
- Proper cabling for future networks

- Locations for satellites, hubs and central ICT equipment

This has to be coordinated with the Urban Planning Department.

4.4 Reduce Import and Export Complexities

There are current initiatives for reducing the complexities of import and export of all products in Lebanon. In the meantime, regulations should be immediately relaxed on all ICT products to reduce the clearance time and costs.

For example, all books ordered are subjected to censorship, sometimes by more than one state apparatus. CDs are often subjected to similar checks. This increases the clearance by courier companies as they have to spend time submitting and collecting the products. Damages have been known to occur as well as cases of pilferage. The latter is particularly common on products that are popular with software pirates as this would be their chance to acquire, illicitly original copies from which they can make copies.

The recommendation would be to relax all such restrictions and allow ICT products to be easily imported and exported.

4.5 Remove Trademarks as a Prerequisite for Domain Names

A law currently requires applicants for .lb domain names to acquire a trade mark from the Ministry of Economy and Trade. This is a cumbersome process taking 8 weeks with more than 5 visits to the Ministry.

Lebanon is the only country that requires such a condition. This is causing applicants to opt for international domain names and making the Government lose income.

It is recommended that this restriction be removed and resorting to valid Commercial Register documents or other documents that authenticate the registering party. Alternatively, the process could be reengineered to reduce the turn around cycle to a few days.

4.6 Create Incentives for ICT Training Companies

It is estimated that there are 100 registered training institutes in Lebanon that address ICT skills directly. Only 10 of the above training institutions are certified training centers for the products they teach.

The following is recommended:

- To provide incentives to such centers in terms of reduced taxation (Income, municipality, etc).
- Assist those providing formal certification courses in terms of diverting donor funding.
- Encourage professional ICT associations to look into the status of these companies and help them in terms of additional trainer training, provision of products and improvement of facilities.

Training companies become a key source of ICT literacy.

4.7 Start ICT Education at an Earlier Age

The Ministry of Education has recently introduced ICT subjects in the Secondary stream of general education. In itself, this is recommendable. However, given that children in primary schools are much faster learners and more adept at new technologies, it is recommended that ICT education should start very early. This would have the added advantage of reducing the need for secondary introductory material allowing the secondary stream to tackle more advanced ICT skills.